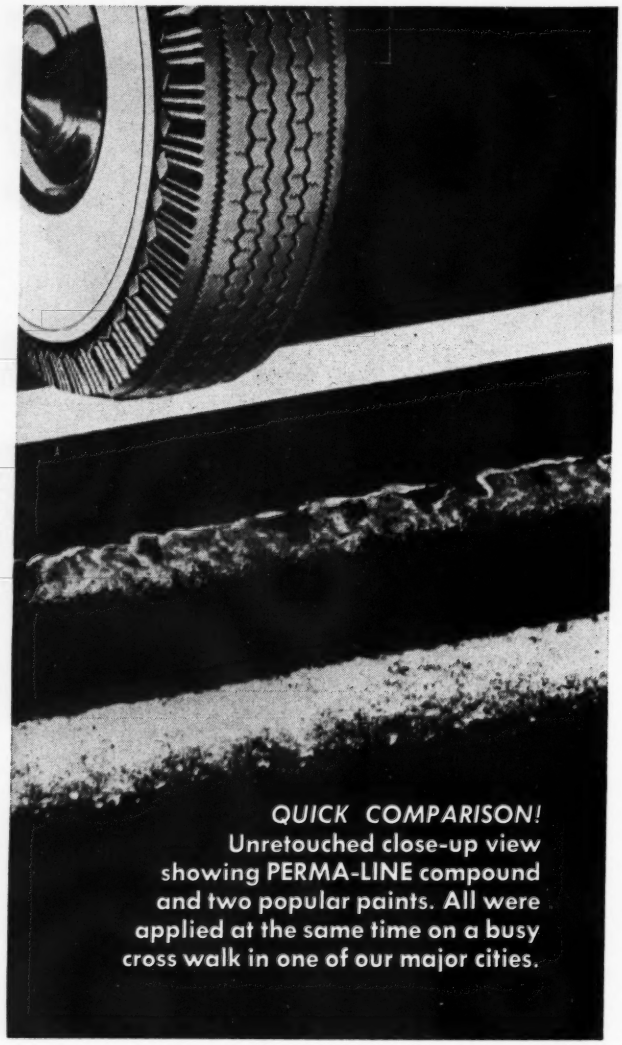
JULY, 1956

Traffic Engineering

Baseball Had a Big Day Sunday

- Freeways in the San Francisco Bay Area
- Slow Traffic Laws Waste Fast Roads
- A Major Street Planning Procedure

Official Publication of the Institute of Traffic Engineers



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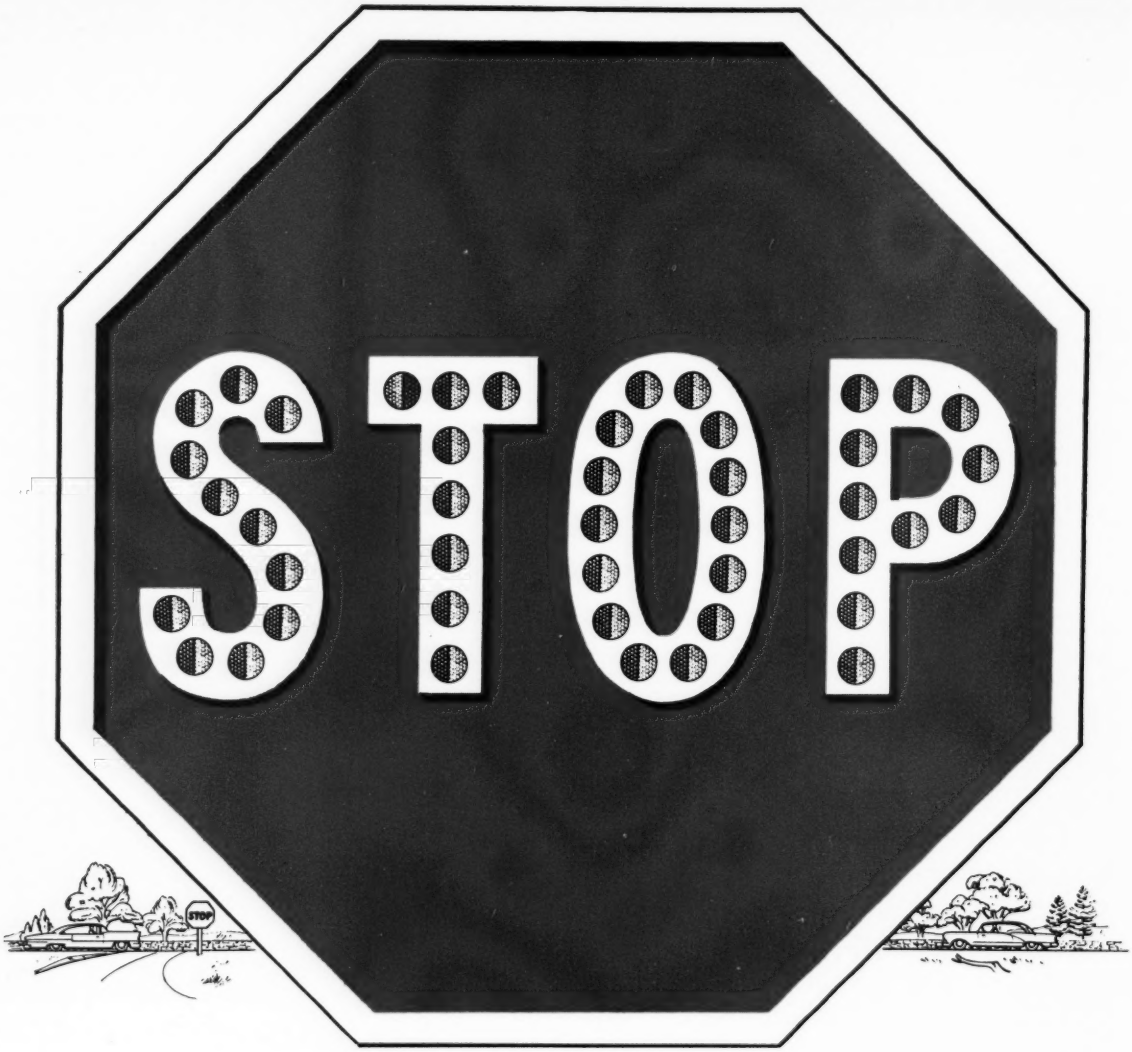

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Traffic Engineering

OFFICIAL PUBLICATION OF THE INSTITUTE OF TRAFFIC ENGINEERS

Vol. 27 JULY, 1956 Number 10

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In This Issue

Freeways in the San Francisco Bay Area 427
B. W. Booker

Slow Traffic Laws Waste Fast Roads 447
J. Edward Johnston

A Major Street System Planning Procedure 453
William S. Pollard, Jr.

Traffic News 458

New Appointments 459

Looking Ahead 459

Institute Affairs 460

New Members and Transfers 461

Position Available 461

Strictly Business 463

Section News 465

Index to Advertisers 468

Professional Service Directory ..... Inside Back Cover

COVER: A Sunday afternoon baseball game in Milwaukee, Wisconsin attracts large crowds and many vehicles as indicated in the photograph on the cover. The parking area is over four times the area occupied by the baseball stadium. Note the number of buses in the left center of the photograph.

Photo Courtesy of Milwaukee Journal

DEFINITION: Traffic Engineering is that phase of engineering which deals with the planning and geometric design of streets, highways, and abutting lands, and with traffic operation thereon, as their use is related to the safe, convenient, and economic transportation of persons and goods.

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Frankly Speaking

GOOD RELATIONS with the public is a most important requisite for every Traffic Engineer. Seventeen years in traffic engineering and public works fields has convinced me of this. The need for good PUBLIC RELATIONS arises from a number of problems.

Citizens, and business men in particular, tend to be selfish—that is, self-interested. Each business man seeks the easiest possible access to his store for his customers. Volume traffic means volume dollars in trade to him. P.T.A. groups and parents, understandably concerned, ask safety precautions at crossings which by approved standards are excessive. Frequently these same school patrons do not practice safety themselves. Too, there are property owners who expect the traffic engineers to keep all cars from parking in front of their property,—but when driving elsewhere expect to park directly in front of property of others. This latter group often erects unofficial signs forbidding parking — signs that must be taken down by the traffic engineering crews.

All of these problems are typical of those that make it necessary for the Traffic Engineer to build good PUBLIC RELATIONS. He must be tactful if he expects to be successful, and to be most useful to his employer. He must have, or must learn, control of his temper. And each citizen must be dealt with as an individual — a separate personality with a distinct problem. This is a very difficult job at times, particularly when the citizen is unduly sarcastic and threatens to bring all kinds of pressure. Nevertheless, the Traffic Engineer is a public servant and must handle himself as such; there is no place for the beneficent dictator or the all-powerful city official.

I find that one often receives impossible requests. Offer a solution of some kind in answer to them. And when you make a promise in some matter, keep it. Citizens remember such promises; building a reputation for dependability is an aid to good public relations.

All Traffic Engineers need to be good public relations men, as well as good technicians. Colleges and special schools would do well to teach coursesthat will assist Traffic Engineers in meeting the very difficult problems in relations with the public — the citizens of the city or state in which they will live and work.

GEORGE J. FISHER
Director, District 4

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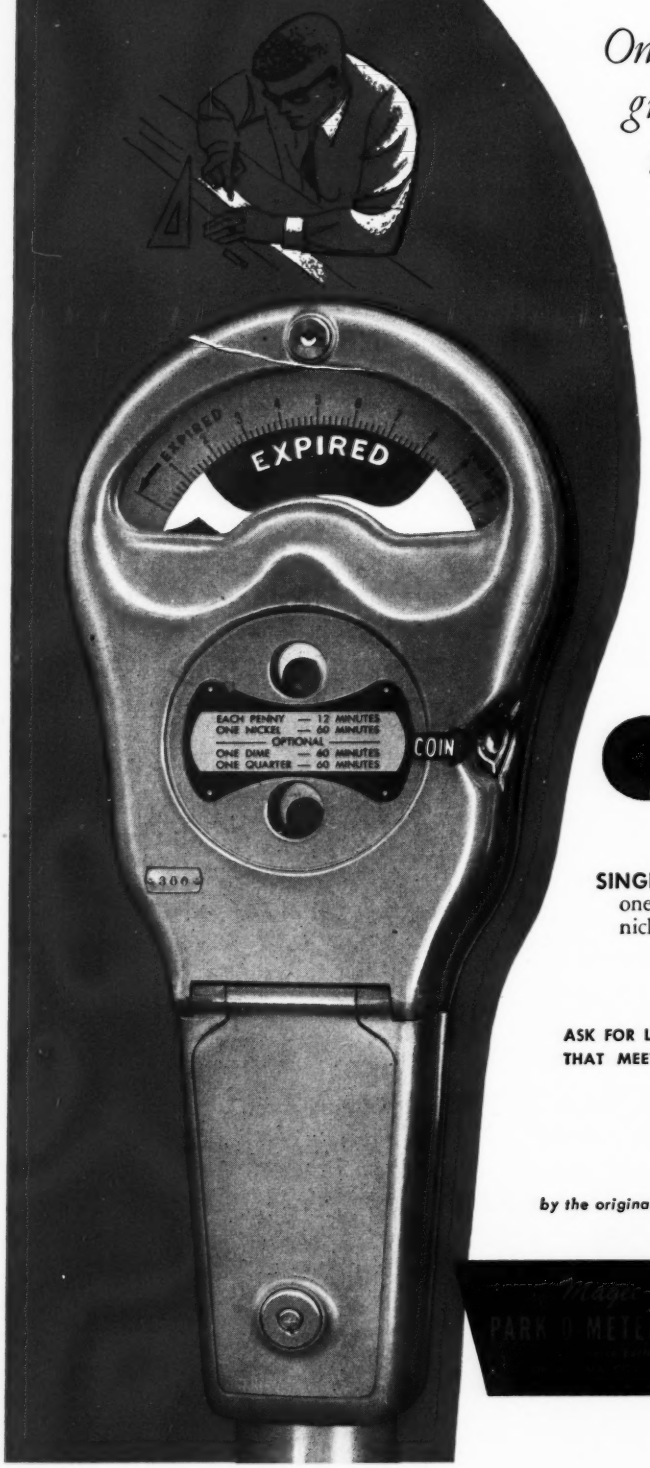

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Freeways in the San Francisco Bay Area

By B. W. Booker

Assistant State Engineer, California Division of Highways

IN DISCUSSING THE GROWTH of the San Francisco Bay area's modern highways, one becomes conscious that the word "freeway" occurs with sometimes monotonous regularity. Actually, the goal is not merely to build this type of facility. The objective is to create a complete system of all types of highways capable of moving people and goods rapidly, safely and conveniently between concentrations of population, at the same time affording similar service to dispersions along the routes. Since the main artery of such a system is the freeway, the name has become synonymous with modern highway development.

It would be difficult to imagine a modern public work upon which more people depend than that of motor transport and the roads upon which it operates. Affecting our daily programs and our manner of living as it does, it is to be expected that conflict of interests will arise in its construction and in its operation, and it follows that from such conflict will arise criticism. In the foreground of this criticism is the allegation that freeways are obsolete immediately after completion.

Logically, the fact that freeways are traveled to their maximum capacity is the reverse of obsolescence. It is conclusive proof that the freeway has accomplished its purpose. The advantages offered have drawn traffic from congested streets and roadways, the force of the attraction being limited only by the capacity of the facility. Pausing for a moment to reflect upon the rise of traffic volume since 1947, when the first section was opened, we can readily contemplate the complete strangulation of the area if the present freeways disappeared, and the system was returned to its pattern of that date.

Problem of Future

Obviously, the routes presently being constructed will not meet the needs of the future. It is equally obvious that we should not attempt to construct the ultimate development at this time. To do so would seriously delay initial correction of the numerous severe deficiencies throughout our highway system. Current construction does provide for additional lanes to be built when needed, and in one case, that of the Eastshore Freeway south of High Street, we are now constructing the additional lanes provided for in the original design.

However, the useful number of lanes which can be expected to operate efficiently is limited and studies are being made of new routes for area traffic distribution. Complicating such studies is the unusual geography of the area. Separated by the waters of the bay, the two great centers of population on the easterly and westerly sides must be served by virtually two systems, the integration of the systems being dependent upon crossings available. The cost and complexity of transbay facilities understandably limits their construction, thus creating restrictive controls in planning a balanced network.

New Major Routes

The year 1955 witnessed a significant step toward the creation of new major routes in District IV. As approved by Commissioner C. D. Curtiss of the U. S. Bureau of Public Roads, the National System of Interstate Highways was adjusted and augmented in the amount of 135 miles in the Bay area. These highways are eligible for substantial allocations of Federal Interstate System funds under the terms of legislation recently adopted by the Congress.

Much of the routing added was already established as a part of the State Highway System and planning for the future development of these as freeways is generally well advanced.

Portions of the future freeway system in San Francisco are included in the addition but studies of the general location of these routes are not complete to date.

A major part of the addition is a 115-mile circumferential route around the San Francisco Bay area. This route begins at the south city limits of San Francisco and runs southeasterly, west and roughly parallel to US 101 (El Camino Real) then swings easterly in the vicinity of San Jose, veering northerly through central Alameda County and the San Ramon Valley in Contra Costa County to the Martinez-Benicia area, finally connecting with US 40 in Vallejo.

From San Francisco to San Jose, the proposed route would constitute a new highway not presently in the State Highway System. From a connection with Sign Route 17 west of San Jose, it follows the general location of State Sign Routes 17 and 21 as far as Benicia. A substantial portion of the East Bay Route is in the planning stage, in design, or is currently under construction. The general location of the new route is shown on the accompanying map. It is apparent thereon that it will supplement the services of the present Bayshore Freeway on the San Mateo Peninsula as well as El Camino Real and the various local arterials accommodating both the through and many of the local traffic desires. Likewise, on the East Bay side, it will supplement the Eastshore Freeway and the transcontinental US 40, serving through traffic and the expanding local traffic of central Alameda and Contra Costa Counties along the way.

This paper originally appeared in the March-April 1956 issue of California Highways and Public Works, and should be of particular interest since the 1956 ITE Annual Meeting will be held in San Francisco the latter part of September this year. —EDITOR

Sixty-three Construction Projects

As of March 1, 1596, District IV had a total of 63 construction projects under way. Twenty-seven of these involved development of the freeway network.

Seventy-one miles of new freeway construction were included in the work under progress. Budgeted and not yet started are another 27 miles of freeway improvement. After completion of the 1956-1957 Fiscal Year construction program, a total of 250 miles of freeway will be in service in this district.

The district is currently operating under a program of $61,647,000 for construction and right of way in the 1955-56 Fiscal Year and $59,172,000 in the 1956-57 Fiscal Year. In addition, contracts under way as part of the Carquinez toll facility project amount currently to $28,834,000, of which $20,877,000 represents work located in District IV.

Status of District IV freeways is indicated on the accompanying map. (See Figure 2 and Table 1.) Developments of this network of modern arterials of safe, convenient and rapid transportation is becoming more and more apparent as the fruits of previous years of planning and endeavor are rapidly being transformed from blueprints to realities, com-

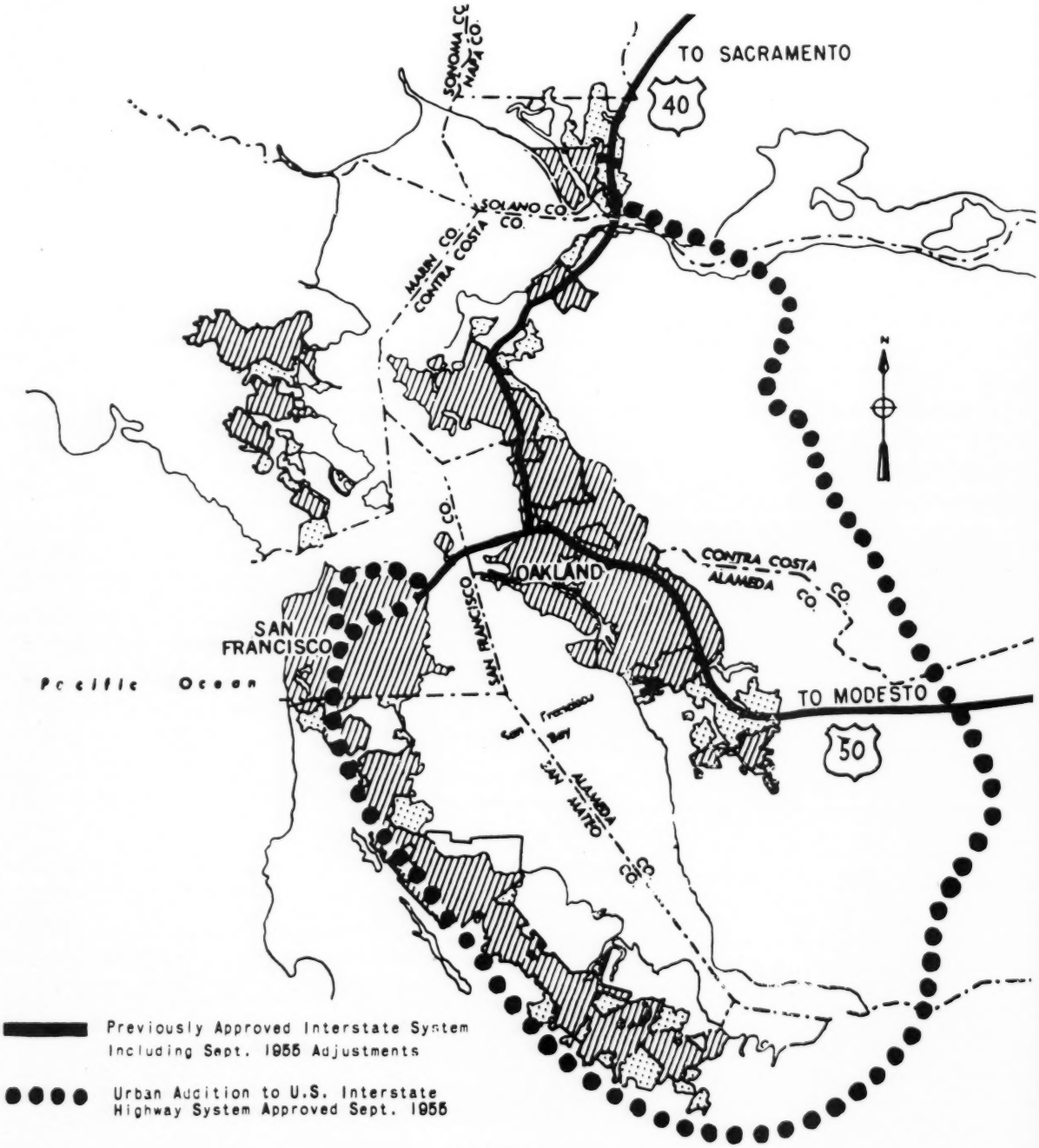

Figure 1
Existing and Recently Approved Interstate Highway System for the San Francisco Bay Area

mensurate with the availability of funds for highway construction.

Highlights of Progress

Highlights of the progress of these transformations during the past 12 months together with mention of projects financed but not yet under construction are indicated in the following excerpts from activities on our various freeway routes.

Bayshore (James Lick Freeway and Skyway)

Several additional units of this freeway were placed into service during the past 12 months.

Except for a short portion southerly of Third Street which will be completed in conjunction with the "open water" fill relocation now under way south of the city limits, all of Route 68 within the city has now been completed as a full freeway.

Traffic now traverses this six and eight-lane Skyway from Third Street near the south city limits directly to the San Francisco-Oakland Bay Bridge. (See Figure 3.)

Skyway service is also provided via a portion of the Central Freeway along 13th Street from the Division Street Interchange toward the Golden Gate Bridge. It presently terminates at South Van Ness Avenue and Mission Street.

The completed Skyway has already been a boon to both intracity and intercity traffic. With the completion of the

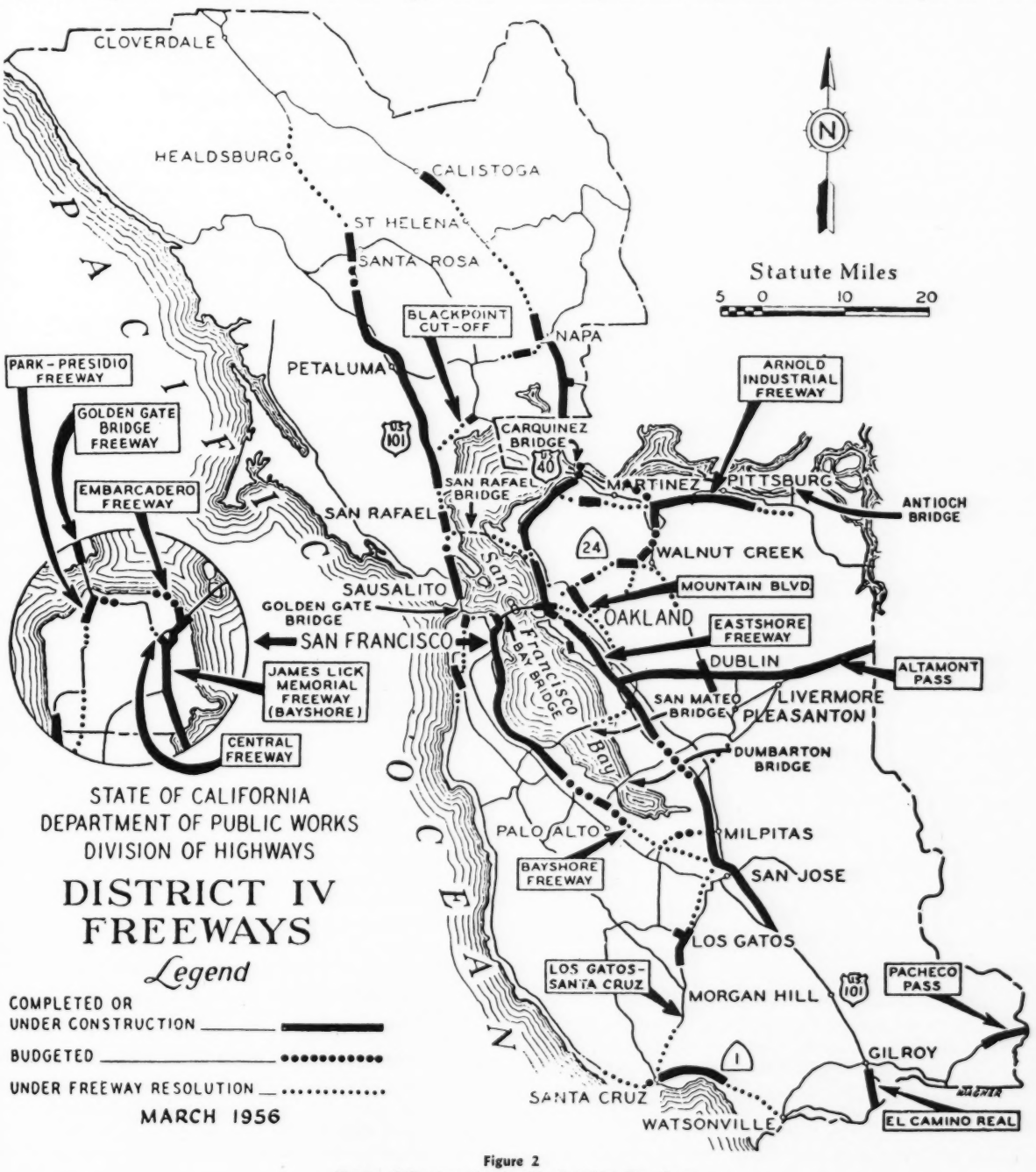

Figure 2
Status of Freeways in the San Francisco Bay Area

STATUS OF DISTRICT IV FREEWAY PROJECTS

March, 1956

	Total miles	Completed projects		Under contract		Budgeted		Right of way expended and budgeted
		Miles	Const. cost	Miles	Const. cost	Miles	Const. cost	
Bayshore and James Lick Freeway; Bay Bridge to Ford Road south of San Jose	56.6	27.5	$38,043,000	5.3	$5,518,000	7.4	$8,740,000	$32,472,000
Central Freeway; James Lick Freeway to Turk Street	1.8	1.0	4,973,000					5,300,000
Embarcadero Freeway; Bay Bridge to Broadway	1.5			1.2	7,701,000	1.1	5,300,000	10,544,000
Golden Gate Freeway; Lyon Street to Route 56	1.1					1.1	3,900,000	
Park Presidio Freeway; Golden Gate Bridge to Fulton Street	2.1	1.2	1,439,000					50,000
US 101; Golden Gate Bridge to Lytton	66.6	24.3	*12,441,000	20.0	*12,720,000	8.2	6,038,000	7,666,000
Black Point Cutoff; Ignacio to Sears Point	7.3	0.8	1,090,000					280,000
Route 69; Route 1 to Richmond-San Rafael Bridge	2.4					2.1	900,000	483,000
Napa Area and Solano county line to Calistoga (portions)	37.9	14.3	2,235,000	2.7	555,000			1,619,000
US 40; El Cerrito Overhead to Carquinez Bridge	13.6		391,000	11.7	†41,708,000			5,666,000
Arnold Industrial Freeway; Hercules to Bridgehead Avenue	32.0	14.7	4,672,000		40,000			1,196,000
Monument-Martinez—to Solano county line	7.4							
Oakland to Arnold Industrial Freeway near Ohmer	19.8	3.1	1,929,000	6.7	7,446,000			9,530,000
Mountain Blvd.; Tunnel Road near Lake Temescal to San Leandro	9.3	1.1	‡1,408,000	1.3	‡1,617,000	1.0	‡950,000	‡1,125,000
Eastshore Freeway; Richmond-San Rafael Bridge to Bayshore at San Jose	52.7	26.5	35,799,000	9.3	17,587,000	9.0	5,785,000	21,435,000
Altamont Pass; San Lorenzo to San Joaquin county line	33.6	26.3	6,980,000	7.3	7,465,000			6,220,000
Route 107; Route 5 to Walnut Creek (portions)	10.1	2.1	550,000					759,000
Pacheco Pass; 1 mile east of Bell's Station to Merced county line	5.3	5.3	1,286,000					12,000
El Camino Real; Ford Road south of San Jose to San Benito county line (portions)	5.8	5.8	935,000					546,000
Four miles south of Davenport to Watsonville	21.0	7.7	2,740,000	1.3	1,065,000			2,546,000
San Jose to Santa Cruz (portions)	19.9	1.8	1,339,000	3.0	1,736,000	0.4	240,000	6,367,000
Route 113; Bayshore to Eastshore Freeway	8.0					2.1	610,000	99,000
Skyline Boulevard; Edgemar Road to Lake Merced Boulevard in San Francisco (Note: Major part of 1.0 mile in San Francisco financed by city—approximately $285,000 constr.)	3.9	3.9	1,325,000					764,000
Totals	419.7	167.4	$119,575,000	63.8	$105,158,000	32.4	$32,463,000	$114,673,000

* Includes total of $5,000,000 by Golden Gate Bridge and Highway District.
† $28,834,000 Toll Bridge Funds in this amount.
‡ Includes City of Oakland and Alameda County contributions.

part of the Embarcadero Freeway from the Bay Bridge to the Broadway Tunnel, portions of which are now financed or under way, effective distribution of Skyway traffic within the downtown San Francisco area will be accomplished.

More and more use of the Skyway is being made for mass transit through the scheduling of busses destined for areas as far from downtown as Lake Merced.

Some 110,000 vehicles traverse the Skyway daily. All of these users are afforded a scenic, awe-inspiring panoramic view of the San Francisco skyline previously unseen by the multitudes of vehicle users who traveled the low level congested city streets.

The unit between Hester Avenue and Alemany Boulevard was started in June, 1953, and completed in September, 1955. Contractor on this $2,400,000 project was Charles L. Harney, Inc. This project is the southernmost part of the completed freeway in San Francisco and has practically eliminated the severe congestion at the Third Street intersection as well as along the old Bayshore Boulevard during peak hours. This will be further improved in the future when traffic will be routed over the Third Street Interchange and across the open water fill project to the south. This will be effected upon completion of the latter project presently contemplated for mid-year 1957.

The $3,900,000 unit from Eighth Street to Fourth Street which was started in October, 1953, was completed in July, 1955. This was also constructed by Charles L. Harney, Inc., and is 0.7 mile long.

The project from Fifth Street to Third Street was constructed by Eaton and Smith at a cost of $900,000. This was started in May, 1954, and completed in July, 1955. It connects the Skyway with the San Francisco-Oakland Bay Bridge and also will serve as a part of the connection to the Embarcadero Freeway, construction of which is now under way.

Central Freeway

The first portion of the Central Freeway was placed in service during the past year with the completion of three projects by Charles L. Harney, Inc. This freeway is also on an elevated structure and is a part of the Skyway.

The unit along 13th Street from the Division Street Interchange to South Van Ness Avenue and Mission Street provided Central Freeway service to and from the south. It was started in July, 1952, and completed in March, 1955. It consisted of two contracts, one for the substructure and footings, the other for the superstructure. The unit connecting the Central Freeway with the Skyway and Bay Bridge was started in June, 1952, completed in April, 1955. All three projects amounted to one mile in length and cost $5,000,000.

Plans are nearing completion for the continuance of this freeway from South Van Ness Avenue to Turk Street, a distance of approximately 1.1 miles. Right-of-way acquisition is now under way. This future unit, like the rest of the Skyway, will be elevated viaduct, but will be a two-level facility. Three southbound lanes will be elevated over the three northbound lanes and all will be elevated over the existing city street system, with most streets remaining open.

Embarcadero Freeway

Construction of the first project on this multilane elevated freeway was started in May, 1955, and is now in progress. This work is being performed by MacDonald, Young and Nelson, and Morrison, Knudsen Co., Inc., at our estimated cost of $5,600,000. It is 0.9 mile long and will provide a connection between the Skyway and Mission Street at Main and Beale Streets. The Oakland-bound movement and the extension of the freeway to Howard Street is estimated at $2,000,000 and is now under way under a contract with C. L. Harney, Inc. Plans for the continuance of this freeway past the Ferry Building to Broadway are virtually complete and it is expected that a contract will be advertised in May of this year. This will complete the total of 1.5 miles between the Bayshore, Bay Bridge and Broaday. It is planned to eventually extend this freeway to a connection with the Central and Golden Gate Freeways near Lombard Street.

Studies are in the early stages at present and the location for this future development has not been determined.

Southern Freeway

With virtual completion of the Bayshore (James Lick) Freeway in San Francisco, and as the most needed units of the Embarcadero and Central Freeways are now in design and construction stages, planning has been directed to other near future segments of the much needed integrated San Francisco system.

To this end, preliminary reconnaissance studies have been completed covering the Southern Freeway which begins at the south city limits near Junipero Serra Boulevard and traverses generally on relocation along the Southern Pacific Railroad roadbed and Alemany Boulevard to the Alemany Interchange on the Bayshore Freeway. This location has been presented to the public in a recent meeting held for informational purposes. The Highway Commission held a public hearing on the proposed location on April 6, 1956, in San Francisco.

The City of San Francisco is well advanced with their plans for the extension of the Southern Freeway from the Bayshore-Alemany Interchange to a junction with the proposed Southern Crossing and Embarcadero Freeway in the vicinity of Third and Army Streets.

Golden Gate Freeway

Included in the 1956-57 Freeway Construction Program is the amount of $3,900,000 for the revision of the interchange between the Golden Gate and Park Presidio Freeways at the south approach to the Golden Gate Bridge. This 1.3-mile project will add two more lanes to the Golden Gate Freeway between the Park Presidio Freeway and the Marina approach resulting in a total of eight lanes as well as revising the ramp connections accordingly. This project should be under construction by the end of this year.

Bayshore Freeway, San Mateo County

The over-water-fill section between the completed freeway at Third Street in San Francisco southerly to Candlestick Point and across the open water of an arm of San Francisco Bay to Sierra Point and connecting with the completed freeway near Butler Road, in South San Francisco is the only portion of the freeway remaining to be completed between the Bay Bridge and just north of Redwood City. With the exception of this remaining link, construction of which is now under way, the entire 25 miles can now be traveled on a full six-lane freeway to Alemany Interchange and on eight lanes to the bridge.

When completed in 1957, this project will afford six lanes of full freeway with provisions for eight lanes in the future. The present six-lane highway will continue as an entrance into the city.

A saving of as much as 20 minutes of travel time in one direction will be realized by the great number of commuters who twice daily traverse this route.

On the north end of this unit, construction was performed by Edward Keeble. The contract was for grading and structures between Third Street and Candlestick Point. This $700,000 project is 0.7 mile long, and was completed in October, 1955. Paving will be done upon completion of the remaining portion of the grading and structures of the over-water-fill unit.

Over-Water Project

From Candlestick Point southerly, work was previously completed on two contracts for filling experimental sections of embankment, displacing the highly fluid bay mud which

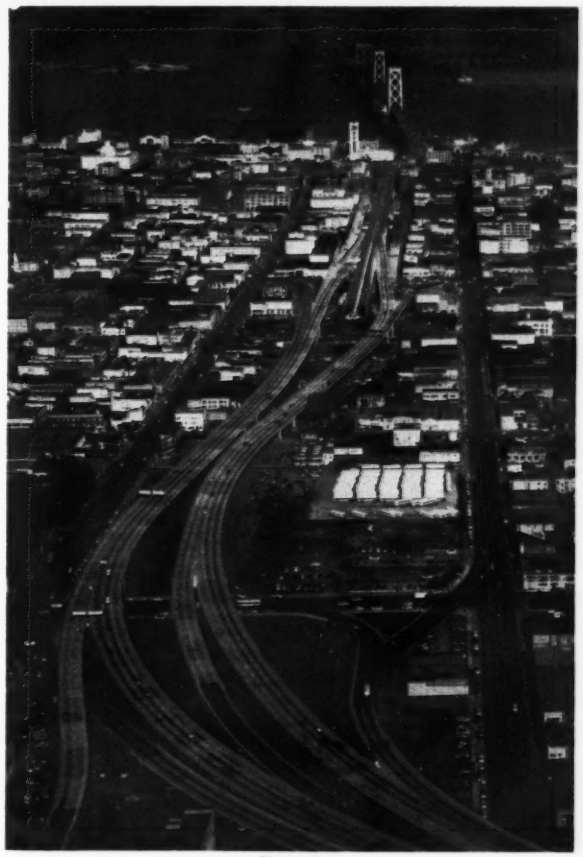

Figure 3
James Lick (Bayshore) Freeway in San Francisco Looking Toward the Bay Bridge; 7th and 8th Street Ramps in lower center; 4th and 5th Street ramps in center

reaches a maximum depth of 70 feet. (See Figure 4.) The first job extended 0.3 mile southerly from Candlestick Point. It was performed by Edward Keeble and amounted to $160,000. The second experimental fill, 0.4 mile long, was not contiguous to the first one. It was performed farther south in the Bay where the mud depth was greater. This job was done by Guy F. Atkinson and cost $860,000. The fill closing the gap between the two experimental fills was started in April, 1955, and completed in February, 1956. John Delphia performed this 0.8-mile job at a cost of $400,000.

Continued progress has been made by the Guy F. Atkinson Co. over the remaining portion of the grading and structures in this unit of the freeway. This work is comprised of two contracts, one of which was completed in October, 1955. Construction totals $3,800,000.

The last project in this unit, the paving of this 3.6-mile link in continuous freeway is included in the 1956-57 Fiscal Year construction program and will be advertised for bids this summer.

Bayshore Freeway, San Mateo to Santa Clara County Line

After this next year's construction progress is completed, the entire Bayshore Freeway in San Mateo County will have been completed. In June, 1955, the Piombo Construction Co. completed the initial six-lane future eight-lane freeway between 16th Avenue in San Mateo and Bransten Road near the San Carlos-Redwood City limits. This project was started in July, 1953, and cost $4,100,000. It eliminated many serious points of traffic conflict and provides inter-

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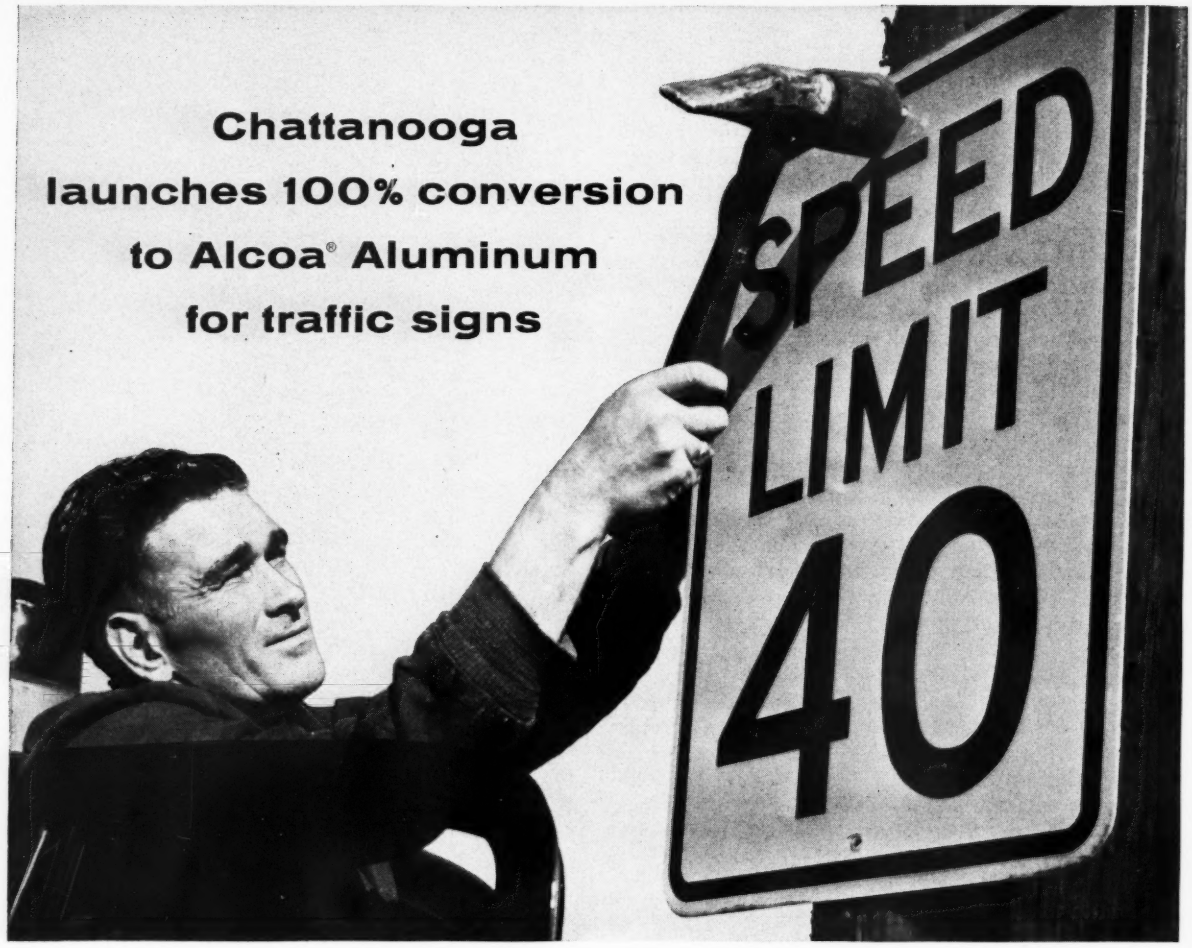

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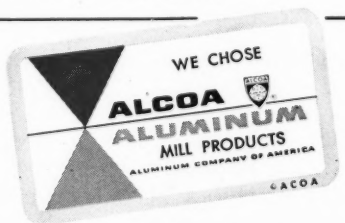

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Figure 4

Left: Construction Scene on Bayshore Freeway looking south from 3rd and Bayshore Interchange in San Francisco looking toward Sierra Point. Right: Open Water Fill for Bayshore Freeway Across Candlestick Cove. Grading Operations at Sierra Point in Foreground.

change for local traffic distribution at 19th Avenue in San Mateo, East Hillsdale Boulevard further south, Ralston Avenue in Belmont, and Holly Street in San Carlos.

The remaining eight miles of freeway from Bransten Road to south of the Santa Clara County line is composed of four projects. Three of these amount to $7,000,000 and are included in the 1956-57 construction program. Construction will commence about July of this year. The other project, the Willow Road Interchange, is nearing completion at a cost of approximately $850,000. L. C. Smith Company is contractor on this project which started in May, 1955. It is now in use by traffic and eliminates the most congested intersection on the Bayshore Highway.

Skyline Boulevard, San Mateo-San Francisco Counties

In December, 1954, a 2.3-mile portion of expressway on Skyline Boulevard between Edgemar Road and Alemany Boulevard was placed in service. Plans have been completed for the future relocation for Sign Route 1 as an expressway from Edgemar on the coast to connect with the Skyline Boulevard expressway at Edgemar Road. Actual construction is dependent on availability of funds.

In July, 1955, continuation of the expressway northerly of Alemany Boulevard 1.3 miles to the south city limits of San Francisco was started under a contract awarded to Charles L. Harney, Inc. This project cost approximately $350,000. Concurrently, also under construction has been the 1.0-mile portion north of Lake Merced Boulevard, also as an expressway and costing $350,000. Both projects were opened to traffic on March 15, 1956.

These Skyline Boulevard projects provide another major connection to and within San Francisco from the rapidly developing residential areas in San Mateo County along the skyline and coastal routes.

Eastshore Freeway, Alameda County

The two remaining unconstructed projects of the East-Shore Freeway between San Jose and Oakland are now contracted or financed. When these projects are completed, a total length of 38 miles of continuous freeway will be in service.

The nine-mile unit from Warm Springs to Beard Road north of Centerville is included in the 1956-57 Fiscal Year construction program. It is expected that this $6,000,000 initial four-lane, future six-lane freeway will be advertised in May, 1956, with construction starting in June.

The 5.8-mile portion from Beard Road northerly to Jackson Street in Hayward is being constructed by Gordon H. Ball and Ball & Simpson at a cost of $4,600,000. This is also an initial four-lane, future six-lane freeway. Besides interchanges at each end of this project local traffic distribution will be provided by interchanges at Alvarado-Niles Road, Whipple and Alquire Roads, and Tennyson Road.

Work has now started on the addition of two lanes to the existing four-lane portion of the Eastshore Freeway between Route 228 and High Street in Oakland. Work on this $2,000,000 project is being done by Fredrickson & Watson Construction Co. As is generally done in freeway design, provision was made in the original plans for the addition of the two lanes in the center median width. Provision was also made in the original structures for the present expansion and very little loss of original construction is involved. The funds which would have been required for the two lanes at the time of original construction were more effectively used for extending the freeway further south from Lewelling Boulevard to Jackson Street which resulted in considerably earlier traffic service to the area.

The two additional Eastshore Freeway lanes are now required in conjunction with the completion of the connec-

tion from the Eastshore Freeway at Lewelling Boulevard to US 50 and Foothill Boulevard near Hayward which will add more traffic to the already heavily traveled existing four-lane freeway. This $2,900,000 project is 2.9 miles long and is expected to be completed in early summer of this year. The work is being performed by Ball & Simpson, Erickson, Phillips and Weisberg. It is to be a four-lane freeway.

Eastshore Freeway, Oakland

The only portion of the Eastshore Freeway in Oakland remaining to be financed is the 0.9-mile unit from Fallon Street to Market Street.

In September, 1954, Fredrickson & Watson Construction Company, and M & K Corporation started constructing the unit from Market Street between Fifth and Sixth Streets to Eleventh and Cypress Streets. This elevated, eight-lane freeway was completed in October, 1955, and cost $1,700,000 for the 0.8 mile. (See Figure 5.)

The remaining 1.4 miles from the foregoing project to the distribution structure is now under construction in the two separate contracts with Grove, Shepherd, Wilson & Kruge of California at an estimated total cost of $8,700,000. This section will be an eight-lane double-deck viaduct with opposing traffic carried on different levels.

The $4,500,000 contract expanding the distribution structure at the east approaches to the Bay Bridge was completed in October, 1955. (See Figure 6.) This project expanded the original structure which had been carrying a volume of 120,000 vehicles per day. The expanded facility will now effectively handle double the present traffic without congestion. Cross weaving of traffic necessitated on the original structure has been eliminated. The entire facility is a five-level one which provides three levels of highway movements on top of two levels of railroads which are also separated.

North of the distribution structure along the shore line of Berkeley and Albany to El Cerrito Overhead the eight-lane freeway is rapidly nearing completion. In 1954 it was completed from the distribution structure to northly of Ashby Avenue.

From Ashby Avenue to El Cerrito Overhead, Peter Kiewit Sons Company, who had constructed the unit to the south, continued the freeway improvement. This project cost $4,800,000 and was completed in September, 1955.

The foregoing project did not include paving and structures for the 1.6 miles between University Avenue and El Cerriot Overhead. Stolte, Inc., and Gallagher & Burk, Inc.,

Figure 5
Completed Portion of Eastshore Freeway from Market to 10th Street. Remaining Portion from 10th Street to Distribution Structure shown left to right in center of photograph.

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Figure 6
Distribution Structure from Bay Bridge Toll Plaza Looking East

are contractors for this remaining $2,250,000 job which started in January, 1955, and which is expected to be completed in July, 1956.

US 40

The entire 12.5 miles from Jefferson Avenue in Richmond to the new bridge across the Carquinez Straits at Crockett are now under construction. The improvement will be an initial six-lane freeway with provision for future eight lanes north of Richmond. A separate and new bridge is to be constructed across the Carquinez Straits east of the existing bridge. This bridge will provide for four lanes of northbound traffic. The existing bridge will be maintained and used for southbound lanes.

Northerly of the city limits of Hercules near the Arnold Industrial Freeway intersection, the improvement is being financed by special toll bridge bonds. Southerly of that point, the project is financed from regular state highway user funds.

From Jefferson Avenue in Richmond to County Road 24 north of Rollingwood, Fredrickson & Watson Construction Company and M & K Corporation are the contractors. Construction began in November, 1954, and it is expected that this 4.8-mile project will be completed in the fall of 1956 at a cost of $5,400,000

The toll-financed projects in this district including the bridge, a portion of which is in District X, are as follows:

CONTRACTS UNDER WAY

Description	Estimated Construction Cost
N. of N. C. L., Hercules to Crockett Road, 2.9 miles Contractors—Ferry Bros., John M. Ferry, Peter L. Ferry, L. A. and R. S. Crow	$7,829,000
Crockett Interchange and approach ramps Contractors—Peter Kiewit Sons Company	5,090,000
Carquinez Bridge substructure Contractors—Mason & Hanger, Silas Mason Co., Inc. and F. S. Rolandi, Jr.	5,942,000
Carquinez Bridge superstructure Contractors—United States Steel Corp.	9,973,000

McCammon-Wunderlich Contracting Co. are the contractors for a $7,400,000 project from south of County Road 24 to the toll bridge projects north of Arnold Industrial Freeway. This unit is 4.9 miles in length.

An outstanding feature of the south approaches to the bridge is an earth cut to be made just south of Crockett. This cut will be 245 feet deep on center line. Approximately 8,500,000 yards will be removed. It is the largest cut ever undertaken by the California Division of Highways. Details of the project were covered in Mr. Hollister's article in the January-February issue of *California Highways and Public Works.*

Interchanges providing local traffic service along the route north of County Road 24 will be at County Road 24 (Hilltop Drive), Appian Way (Maloney Road), Alhambra Valley Road (Pinhole Valley Road), Arnold Industrial Freeway, Willow Road, future county road (near Tormey), Crockett.

US 50, Foothill Blvd., and MacArthur Freeways

In 1954, a 1.5-mile portion of this four-lane future six-lane freeway by-passing Castro Valley was completed. To the west, the 2.9-mile freeway connection to the Eastshore Freeway is under construction. That project was discussed hereinbefore in conjunction with the Eastshore Freeway.

East of Castro Valley, a $4,600,000 project is now under construction. This job begins west of Center Street in Hayward and ends at the completed freeway 2.3 miles west of Dublin. Peter Kiewit Sons Company is the contractor on this project which started in October, 1955. When this unit is completed a continuous freeway or expressway will be in service for the 51 miles between Tracy and Oakland via US 50 and the Eastshore Freeway.

From Castro Valley north, another freeway will eventually be constructed through Oakland to the distribution structure at the east approach to the Bay Bridge. To this end, planning and design are now under way, and a location for the MacArthur Freeway along MacArthur Boulevard between the distribution structure and Park Boulevard, approximately 3.5 miles, has been adopted by the California Highway Commission. Acquisition of rights of way has already commenced.

This additional freeway will serve US 50 and adjacent local traffic, much of which now uses the Eastshore Freeway as an entrance into and through Oakland. It will also effectively serve the future heavy residential developments contemplated through the areas served by this route.

Mountain Boulevard

This improvement in the City of Oakland when completed will provide 9.3 miles of full freeway from Sign Route 24 near Lake Temescal following the general route of Mountain Boulevard to a connection with Foothill Boulevard (US 50) near San Leandro.

Joint Highway District No. 26 was dissolved in July, 1954, but the County of Alameda and City of Oakland have agreed to continue to finance a total of $300,000 per year matching a like contribution by the State toward the continued improvement of this freeway through the Oakland hills.

Two projects were placed under way on this route during the past year. These supplement the previously completed portion which extends from north of Broadway Terrace to south of the Moraga Thornhill intersection, a distance of 2.3 miles.

One of the projects is being constructed by Charles L. Harney. It covers the 1.3 miles between Thornhill Drive and Ascot Drive. Cost is estimated at $1,250,000. Completion is expected in mid-summer of this year. Included in the project are the La Salle Street Overcrossing and the Park Boulevard Interchange. Provision is made in the latter design for the connection of the Shepherd Canyon Freeway into Moraga which will junction with Mountain Boulevard Freeway at this point in the future.

The other project amounting to approximately $130,000 was the Lincoln Avenue separation which was constructed by Stolte, Inc., and Gallagher & Burk, Inc., and completed in December, 1955.

Continuation of this facility to the south is contemplated as rapidly as availability of state, county and city contributions will permit.

Oakland-Walnut Creek-Monument

Accelerated development through the northern half of Contra Costa County is continuing. In the past, congestion along the highways servicing the areas had been rapidly approaching a condition which could seriously affect the continuance of this rate of development. Material progress has been made toward alleviating this condition.

In March, 1955, a 1.2-mile section of initial six-lane future eight-lane freeway consisting principally of the Orinda Interchange was completed by Fredrickson & Watson Construction Company at a cost of $1,500,000.

Further east a 2.8-mile Lafayette By-pass project was started in September, 1955. It will result in a full freeway by-passing the town to the north and allows the existing highway to remain as a high standard uncongested local arterial servicing the needs of the rapidly growing Lafayette community. Work is being performed by Gordon F. Ball. Construction will cost $3,300,000.

Also under construction is the Pleasant Hill Road Interchange at the east end of the Lafayette By-pass. This project, like the Orinda Interchange, will afford effective relief to a seriously congested intersection. Contractor on this $1,300,000 job is Stolte, Inc., and Gallagher & Burk, Inc. Completion is expected in mid-summer, 1956.

From the Pleasant Hill Road Interchange to the vicinity of the north city limits of Walnut Creek, plans are nearing completion and right-of-way acquisitions are under way. This future unit will by-pass Walnut Creek to the west.

Northerly of Walnut Creek from Oakland Boulevard to 0.3 mile north of Monument a $2,900,000 unit of the freeway is also under contract to Stolte, Inc., and Gallagher & Burk, Inc. This unit is a part of the recent addition to the Interstate Highway System. Work started in October, 1955, and is 25 percent complete. Completion of this unit will afford relief to the 27,000 vehicle drivers and their passengers now using the existing two-lane highway daily.

Monument-Martinez-Benicia Bridge

Preliminary studies have been completed for the southern approaches to the Martinez-Benicia Bridge. Construction of this freeway as a toll facility, the financing of which is in conjunction with the Carquinez Toll Bridge project now under way, was authorized by the Legislature in 1952.

The legislation sanctioned a toll facility from Arnold Industrial Freeway south of Martinez to a connection with State Highway Route 74 in Benicia. South of Arnold Industrial Freeway, the proposed facility will be financed from regular state highway funds.

Public hearings by the commission were not deemed necessary by Contra Costa County and the City of Martinez. The Highway Commission has announced that in its March meeting, adoption of the route as proposed between Route 75 north of Monument to the Solano county line, a distance of 7.5 miles, will be considered. The proposed improvement is a part of the recent additions to the Interstate Highway System which is further indication of the importance of this additional major north-south regional and interstate arterial.

Walnut Creek-Dublin

In 1955, the California Highway Commission adopted a route for the extension of the Central Contra Costa Freeway System from Walnut Creek to south of Danville. This four-lane future six-lane full freeway will be on relocation through

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the hillsides east of San Ramon Creek and outside of the beautiful Orchard Valley. Design and right-of-way acquisition have been in progress during the past year.

Further south, 2.2 miles of initial two lanes of a future six-lane freeway were constructed between the Contra Costa-Alameda county line to south of US 50 at Dublin. This project was under contract to Fredrickson & Watson Construction Co. It cost $550,000 and was completed in November, 1955. Included in the contract was a full interchange with US 50 south of Dublin which eliminated a serious at-grade intersection between these two important routes.

All of this route is included in the recent additions to the Interstate Highway System.

Dublin-Mission San Jose

Other activity on this interstate highway route occurred in January, 1955, when the California Highway Commission adopted a route for the future development of a four-lane freeway between Mission San Jose and Sunol. Location will be along the general location of the existing highway with substantial reductions in grade over Mission Pass. Design studies are presently under way.

Los Gatos-Santa Cruz

Congestion relief to areas outside of the immediate metropolitan sphere is also underway in the Los Gatos area. Here, a 2.1-mile freeway is being constructed on a bypass of this critically congested city and when completed, the freeway will remove the large volumes of through traffic from the local street system thereby leaving the latter for the orderly functioning of local activities.

Completed in November, 1955, was a $370,000 contract for a bridge at Main Street on this unit of the freeway. The work was by Carl N. Swensen Company.

Under way is the major contract amounting to approximately $1,300,000 for the 2.1 miles between the sidehill viaduct south of the city, to Saratoga Avenue at the northern extremities. This work is being done by L. C. Smith Company. Included in this project is a relocation of Los Gatos Creek for a distance of 6,000 feet requiring a concrete line channel for the entire length and a double 18-foot x 15-foot x 450-foot concrete box culvert. Here the freeway passes over the channel and under the Main Street Bridge. The storms of the past winter resulted in an approximately $150,000 damage to the contractor's work on this drainage revision which was under way at that time. This project is expected to be completed in midsummer.

To start soon is a connection from the freeway easterly to a junction with San Jose Avenue at Charles Street. Part of this work will be financed by the City of Los Gatos as a cooperative project.

Acquisition of rights of way over the remaining portion of the Sign Route 17 Freeway to San Jose and beyond to a connection with the Bayshore Freeway is accelerating so that this freeway development can continue as rapidly as funds become available.

In Santa Cruz, a new freeway entrance into the city is being provided from existing Sign Route 17 at the north city limits to Mission Street. This project will provide a much needed facility for traffic distribution in the Santa Cruz area and is a part of the eventual freeway from San Jose to Santa Cruz. This project will cost $1,100,000. It is 1.2 miles long and the contractor is the Granite Construction Company. It is expected that the job will be completed in midsummer, 1956.

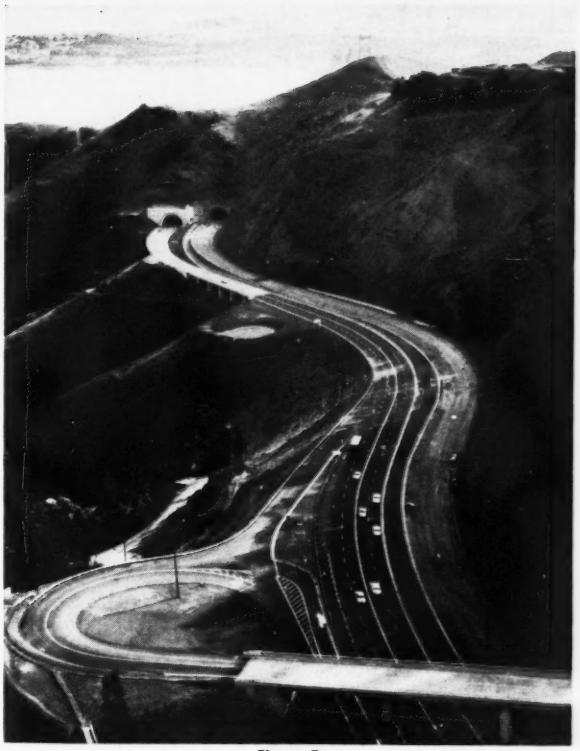

Figure 7

Looking South along Waldo Approach to Golden Gate Bridge. New Tunnel Exit on Left. Spencer Avenue overcrossing in Foreground. Photograph shows two-way traffic on new lanes. Upon completion new lanes will serve northbound traffic and existing roadway on right will carry southbound traffic.

US 101 Bypass, San Jose Area

A project which will improve the existing three-lane facility to an initial four-lane future six-lane full freeway from the present junction of US 101 Bypass and Sign Route 17 to Santa Clara Street is now in progress. This project is 1.6 miles in length, and will cost $1,800,000. The contract is being performed by Lew Jones and Leo F. Piazza and will eliminate the last of the three-lane width north of San Jose on this heavily traveled route.

Other Major Projects in San Jose Area

South of San Jose, on US 101 from Ford Road to Llagas Creek the remaining three-lane sections on this route are being eliminated by the construction of a four-lane divided conventional highway over this 12.7-mile length. The contractor is Carl N. Swensen Co., Inc., and construction will approximate $550,000. This project is now open to traffic.

On Route 9 between Lawrence Station Road east of Bayshore Freeway and 0.2 mile east of the San Jose-Alviso Road, a bypass of the town of Alviso which will be the initial construction of two lanes of a future freeway on new alignment and above flood and tide water level is financed and expected to be under contract in August, 1956. This project will approximate $1,000,000 construction cost.

On Sign Route 9 from 0.5 mile south of McClellan Road to Route 2 the existing, narrow two-lane facility with little or no shoulders is to be widened and shoulders added as interim relief prior to the future freeway development from El Camino Real to Los Gatos. An amount of $320,000 is allocated for this 3.9-mile improvement, and construction is expected to start in April, 1956.

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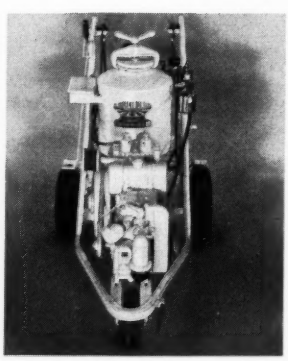

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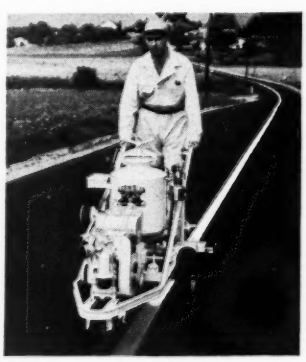

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US 101—Golden Gate Bridge to Santa Rosa

Continued progress is being made toward the near future realization of a completed freeway between the Golden Gate Bridge and Santa Rosa.

The improvement of the Waldo approach to the western end of the Golden Gate Bridge to six-lane freeway standards was dedicated and opened to traffic on March 20, 1956, (See Figure 7.)

Work on this four-mile facility between the bridge and Manzanita has been accomplished in two contracts.

The Guy F. Atkinson Company completed a $4,500,000 contract in April, 1955. This was the major project and covered grading, construction of a twin bore and various separation structures. The second contract now practically completed and amounting to $1,300,000 for completing the drainage, paving and lighting over the project and lining the existing tunnel was done by the A. G. Raisch Company. The Golden Gate Bridge and Highway District contributed $5,000,000 to the total financing.

From Manzanita northerly 5.8 miles to the Greenbrae intersection, full freeway construction is either under way or advertised and several bad intersections are being eliminated.

A new $3,200,000 six-lane structure is being constructed across Richardson Bay by Duncanson-Harrelson Co. and Pacific Bridge Co. Completion is estimated for early 1957. The existing bridge will be removed.

Immediately northerly of the Richardson Bay Bridge job a 2.4-mile contract will extend the freeway to 0.3 mile north of Alto and eliminate the serious condition at the Alto intersection by providing a clover-leaf interchange. This project amounts to $1,300,000 and is being done by Dan Caputo Company and Dan Caputo and Edward Keeble. Efforts are directed toward the completion of this project by the end of this year.

From the foregoing project to 0.6 mile north of the Greenbrae intersection, a distance of 3.2 miles, another project continuing the freeway is expected to be under contract in June, 1956. The sum of $2,900,000 has been allocated for the work which will provide a full freeway to north of Corte Madera Creek, eliminate a serious intersection at Tamalpais Drive and connect with the state construction of the portion of the Greenbrae Interchange now underway. Most of the grading for the future extension to California Park Overhead will also be done.

Greenbrae Interchange

The Greenbrae Interchange project, amounting to $950,000, is being constructed by Carl N. Swenson Company. It is expected to be completed at the end of this year. This project will eliminate the southbound intersection conflict existing at the present intersection but another contract for the completion of the interchange will be required.

Included in the 1956-57 Fiscal Year construction program is the replacement of the existing bridge across the Northwestern Pacific Railroad at Forbes Overhead north of San Rafael. The existing bridge is nearing the end of its structural life. The new bridge and approaches which cost approximately $500,000 for 0.8 mile is expected to be under contract in midsummer of 1956.

In Sonoma County, as a part of the freeway extension bypassing the congested Petaluma business district, two sets of twin structures were completed in April, 1955. This work cost $900,000 and involved structures across the navigable channel of Petaluma Creek and also across the Northwestern Pacific Railroad. The work was done by Erickson, Phillips and Weisberg.

The remaining work covering the entire freeway development from one mile south of Petaluma Creek to three miles north of Cotati at Wilfred Crossing, a distance of 13.5 miles, consists of two contracts, both of which are being performed by Parish Bros., Inc., and Carl N. Swenson, Inc. Total construction cost for both contracts amounts to $6,000,000. The southernmost contract, including the bypass of Petaluma, is expected to be completed in September, 1956, and the remaining work by the end of the year.

Early continuation of the freeway construction northerly to Santa Rosa is assured with the inclusion of that five-mile project in the approved 1956-57 Fiscal Year construction program in the amount of $2,900,000. Construction is expected to be under way early this summer.

US 101—San Rafael-Richmond Bridge

A contract covering the development of a two-mile portion of the western approach to the San Rafael Bridge is expected to be under way in May of this year. An item of $900,000 has been included in the 1956-57 Fiscal Year construction program for the work which will provide a four-lane freeway westerly from the bridge to Sir Francis Drake Boulevard. One deck of the bridge will be open to traffic by October of this year and this project is timed to provide an adequate approach upon completion of the four-lane bridge. It is expected to be completed in midsummer, 1957. Limits of the project extend nearly to US 101, but this is primarily for the incorporation of earthwork encountered in the initial job into the future extension of the freeway from Sir Francis Drake Boulevard to US 101 at the San Quentin Wye. Present work will include an interchange at Sir Francis Drake Boulevard.

Napa Area

A 2.7-mile section of freeway on Sign Route 37 in Napa County was completed in November, 1955. This project extends easterly from a point two miles east of the Sonoma-Napa county line. Arthur B. Siri, Inc., was the contractor on this $450,000 project which constructed the initial two lanes of a future four-lane freeway with right of way and access control initially provided.

Acquisition of rights of way is now under way for the future development of the St. Helena Highway as a freeway from Union Station at the north end of the Napa Bypass to Rutherford. Construction, however, has not been financed.

The initial two lanes of a future four-lane freeway are under construction between four miles north of St. Helena to Calistoga, a distance of 3.7 miles. This project is under contract to Huntington Brothers and will cost approximately $550,000. Completion of the work is expected by the end of this year. This is another instance of the stage construction of a future freeway and at the same time correcting today's deficiencies with a minimum expenditure of today's funds, thus enabling the correction of other deficiencies in the area earlier than could otherwise have been financed.

Conclusion

Perhaps the greatest motivating force in the demand for improvement of highways has been the consciousness of the users themselves that needs were outgrowing the facilities available. One has but to become involved in slow-moving or conflicting traffic patterns to resolve there and then that something must be done. In any one given situation all motorists on the highway are involved and all suffer the

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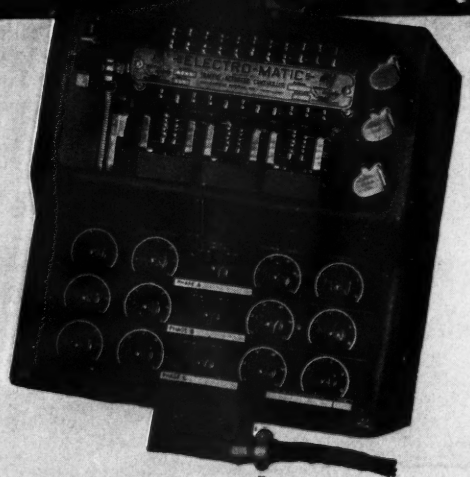

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consequence of inadequacy. This broad effect results in united and cumulative demand for relief.

Of as great, or even greater consequence is the matter of safety. In contrast with the effect of a traffic tie-up, damage to life and property involved in an accident is restricted to individuals or small groups. Our minds seem to have a defensive shield against catastrophes which occur about us daily, and we persist in our refusal to project ourselves into the field of accident liability. Only through the efforts of safety councils, traffic engineers and forward-looking newspapers and journals has the subject of safety been kept in the foreground of public conscience.

Fortunately, safety, convenience and expeditious movement are not incompatible. These three elements are served alike in fundamental freeway features. Elimination of grade crossings, reduction of side friction due to multiple access, high standards of grade and alignment, wide traffic lanes and improved signing, have, among numerous other features, produced facilities which encourage safe and convenient travel at maintained speeds over long distances.

As can readily be appreciated, the reduction of minor accidents usually attending vehicles traveling in the same direction, is not as impressive as the reduction of accidents involving fatalities. It is with the latter type that we are overwhelmingly concerned. The quoting of statistics is ordinarily unproductive, however, the comparison of 2.15 fatal accidents per hundred million miles of travel on freeways, against 8.38 like accidents for the same distance on ordinary rural roads, is more articulate than any descriptive phrase.

As we work toward the creation of an adequate network, we are fully aware that freeways alone are not a complete solution to the traffic problems, particularly with respect to the movement of commute traffic in peak hours in the urban areas. However, we believe that they are the heart of any transportation pattern augmented as it may be. With this firm conviction in mind we will continue to develop the system, confident that each year will bring added safety, pleasure, utility and convenience to public travel in the area.

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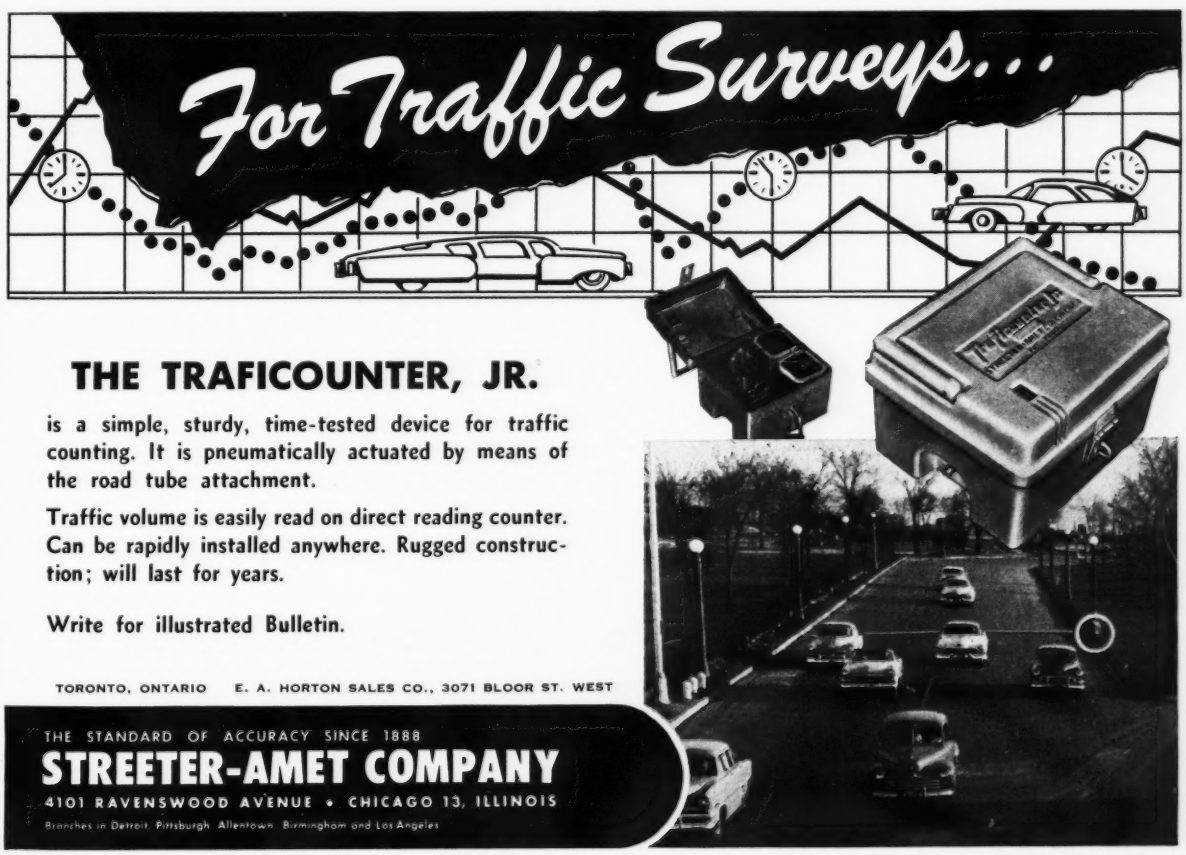

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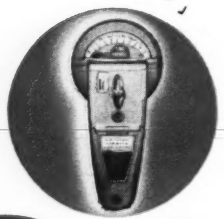

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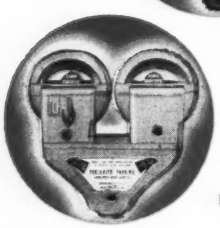

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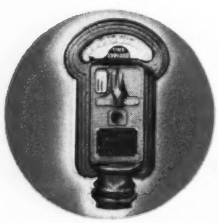

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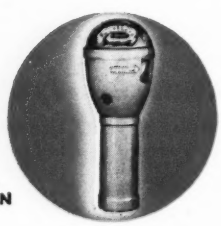

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Slow Traffic Laws Waste Fast Roads

By J. Edward Johnston (Mem., ITE)

Highway Transportation Specialist, Chamber of Commerce of the United States

This article originally appeared in Nation's Business for April, 1956, and is reprinted here by special permission.

It presents a point of view held by many engineers — but one not universally accepted. Would one of our readers like to prepare a rebuttal?

WE MUST modernize our traffic laws or prepare to accept less than full value for the $50,000,000,000 federal highway program we are about to undertake.

Although the cost of new regulations would be negligible, modernization in this field may be more difficult than raising billions for construction. It will mean upsetting some time-honored ideas in highway control.

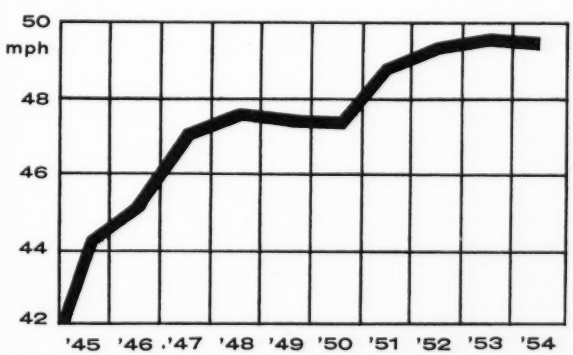
Ever since the first automobile chugged its noisy way among the startled horses and amazed public, the motor car has been subjected to every restrictive traffic law conceived by man. There has been a concerted effort to curtail its movements with stop signs, traffic signals and speed limits. This attitude is already costing us much of the advantage we might gain from improved automobiles and highways. Unless we think more in terms of "go" than "slow" in drafting regulations, it is going to cost us more.

If we are to have effective traffic control we need to answer several basic questions:

Are current traffic regulations realistic?

Do they recognize the trend toward higher speeds and the need for uninterrupted flow of traffic?

Are speed limits high enough to insure that a violation is a gross misdemeanor or do they make violators out of reasonable drivers.



Average speeds rise steadily while traffic laws remain much the same.

Is enforcement too rigid for less important traffic law infractions and not rigid enough for serious offenses?

Hundreds of studies show that the answer to these questions is no. Today the majority of our drivers are consistently violating the legal speed limits. This doesn't mean that the motorists are willful law breakers. It does mean that something is wrong with our regulations.

These traffic studies also bring out a number of basic principles which need to be observed if we are to get full benefit not only from the roads we are planning to build but from those we already have. Among them are these:

Most autoists drive reasonably and properly most of the time and are capable of recognizing conditions that require greater caution.

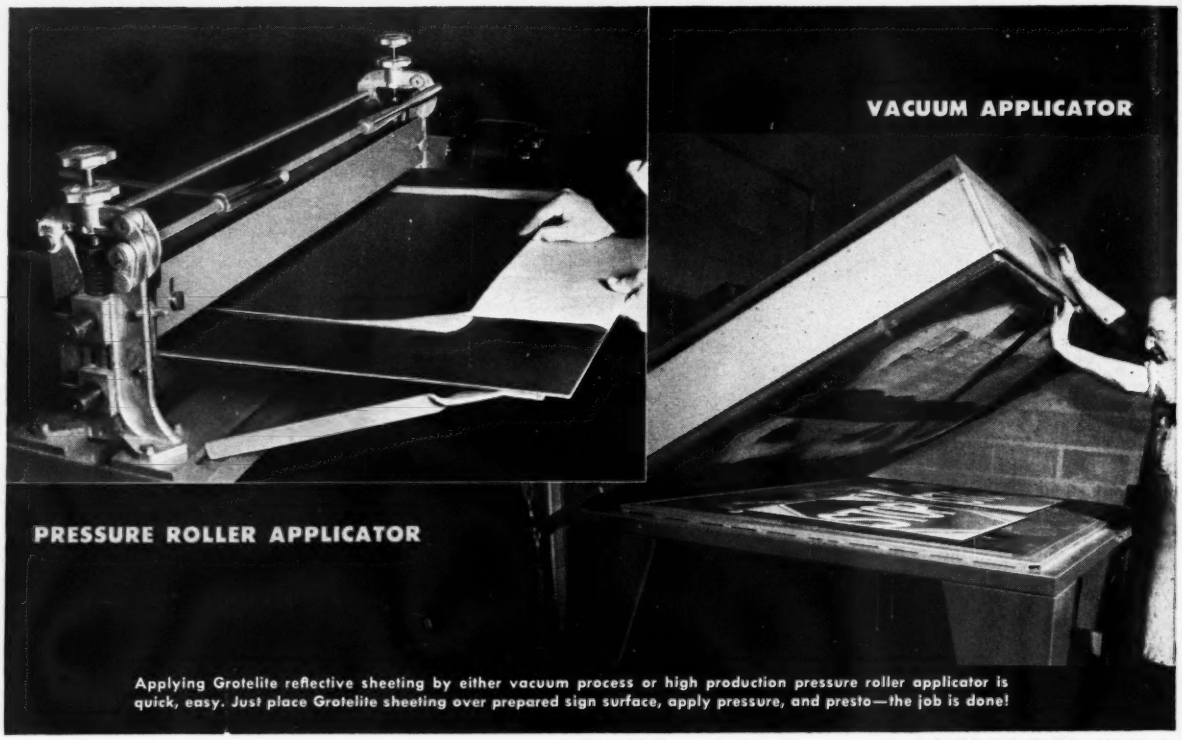
Before we can make progress in adopting realistic traffic regulations, the basic attitude toward drivers must change. The typical American driver is you, your wife, your neighbor, your business associates. Certainly such people are not menaces on the highway. Although every driver drives badly on occasion, the majority are normally cautious, considerate, intelligent, skillful and able to recognize speed too fast for conditions.

This view is not widely held. A recent poll of enforcement officials, motor vehicle administrators, members of traffic commissions and safety officials asked this question, among others: "Is it your impression that the driving public has generally demonstrated the ability to judge safe speeds of travel under all highway conditions?" Eighty per cent answered no.

These authorities see mainly the speeder and traffic violator and they investigate most traffic accidents. Granted that there are too many of each of these and they should be dealt with, they represent a small percentage of the normal driving public. Few drivers are serious traffic offenders and fewer still become involved in accidents.

Speed limits aimed at the few grossly reckless drivers make law violators out of normally good drivers and are of questionable value in controlling the violators.

Unrealistic traffic laws, if obeyed, increase delay and



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congestion but do little to solve the speed problem.

One city was having trouble with teen-agers racing hot rods through its streets. One suggested cure was to impose an unusually low city-wide speed limit—although the racing was done at speeds far exceeding the law already in effect.

Another city attacked the same problem by changing the stop signs from the cross streets to the arterial streets.

Of coure, neither of these remedies worked. Such problems can be solved only on an individual basis through working with the parents of the youths involved, or through the schools, and by enforcing the speed laws already in effect.

But the public is permitting similar, unrealistic, traffic control almost daily throughout the nation.

Speed limits must be reasonable to be observed.

Low limits do not necessarily mean low speeds.

Studies have proven that drivers pay little or no attention to unreasonable speed limits. A small southern city had an unreasonable limit of 25 miles an hour. Surveys on one section of this road showed 90 out of every 100 drivers were exceeding the limit. On another section, 80 out of every 100 were doing so, in spite of the fact that the road was heavily patrolled and arrests were frequent.

In a speed study in a small midwestern city along a normally high speed highway, the limit was set at 35 miles an hour, then 40, 45, 50 and 55. Each limit was left in place several months to permit those who used the road regularly to get used to it. Furthermore, periods with no speed limit were used between changes in the maximum. There was little or no enforcement while the study was made.

The results showed that, whether the limit was 35 or 55 or unlimited, the difference in average driving speed was only four miles an hour. What is more, when the limit was 35, some 18 per cent of the drivers went more than 50. When the limit was 50 only six per cent exceeded it. Maximum voluntary observance was found when the realistic speed limit was used.

A reasonable speed limit is one that will include the speed of all but a few of the fastest drivers.

Many traffic authorities agree that a limit which includes 85 per cent of the drivers is reasonable. A speed limit should seem too high to the majority of drivers.

If this is not the drivers' reaction, the limit is not maximum. The limit should apply only to those who are grossly negligent, taking into account allowances necessary for variables in speedometers and arresting techniques—and this tolerance does not need to be ten to 15 miles an hour as is often the case.

Modern traffic does not adapt itself to fixed regulations. For instance, a reasonable speed on any section of street and highway may vary many times in the course of 24 hours. Speed is affected by the amount and character of the traffic, weather and lighting conditions. Furthermore, a reasonable speed often varies from block to block or mile to mile because of changes in the type and width of pavements, the presence of businesses, homes and schools, grades, curves, etc. Yet, blanket speed limits have been laid down covering wide areas, even entire states for all hours of the day or night and all weather and traffic conditions. Enforcement is then expected to uphold the law. Is it any wonder many drivers have lost much respect for traffic regulations and regard the police as anything but their friend.

Speed control is not the only area where flexibility is needed. In cities greater use should be made of "reversible" and "unbalanced" traffic flow. With "reversible" flow traffic the direction of traffic is changed to accommodate heavy inbound or outbound movements. With "unbalanced" flow the number of traffic lanes for each direction are varied.

Flexibility in parking regulations is needed—particularly where curb parking is still permitted. Parking requirements also vary during the day and limits should be adjusted accordingly.

Radar and other electric speed measuring devices can be effective in speed enforcement if speed laws are realistic.

Most of our speed laws were not designed to be enforced. by devices that make accurate speed measurement possible. Wide tolerances were expected between the posted limits and the speed at which an arrest would actually be made. Such devices as radar make possible the arrest of every driver exceeding a speed limit by even one mile per hour. The wholesale arrest of drivers for minor infractions that this makes possible was not the lawmakers' intention.

Speed limits should encourage uniform speeds.

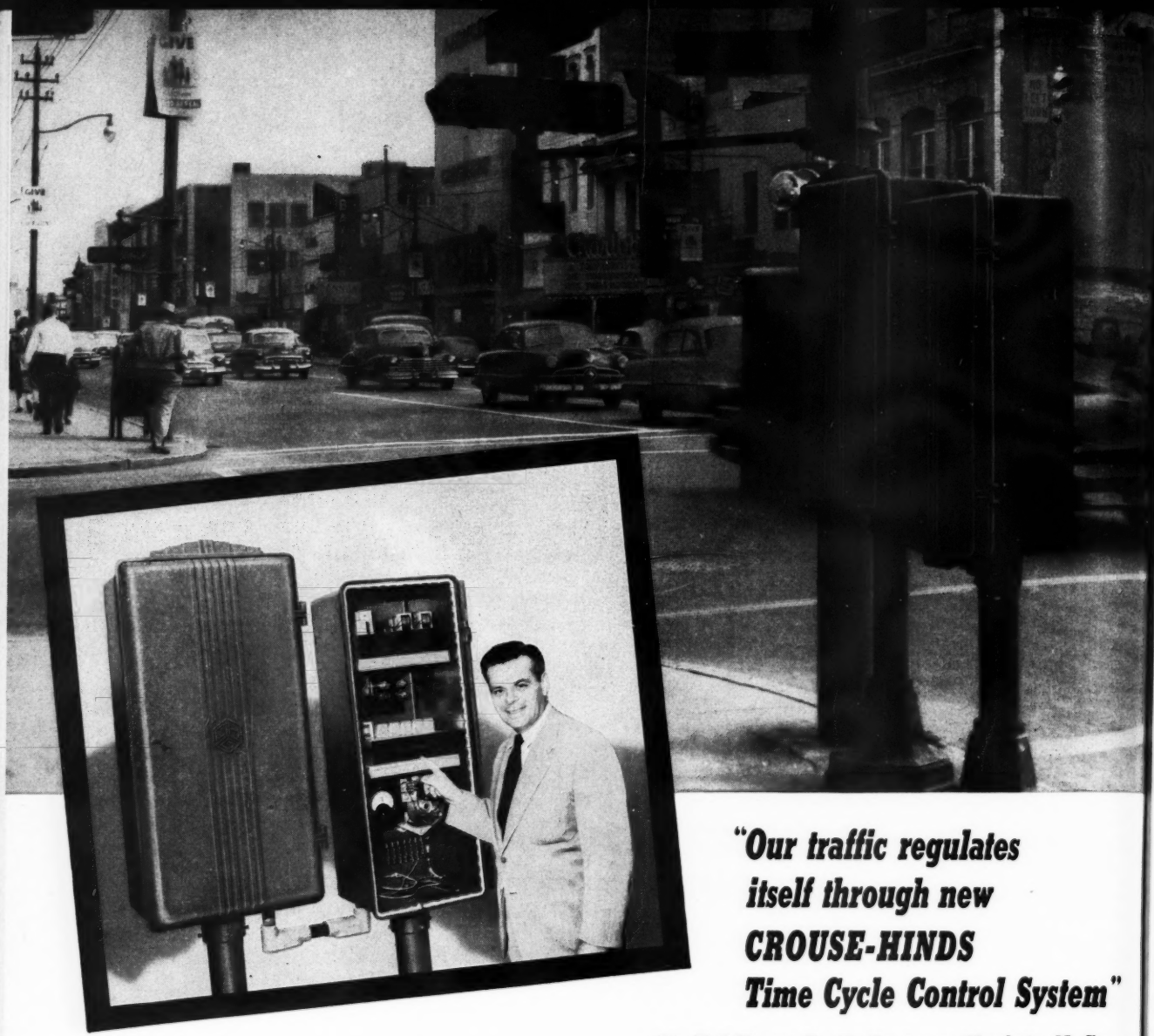
If all traffic moved at the same speed, there would be no overtaking and passing—which results in a large number of fatalities and injuries. The greatest tendency toward uniformity is achieved when no more than 15 per cent of the drivers exceed the clearly posted speed limit.

There is no such thing as a safe speed limit.

Accidents and fatalities occur at all speeds. Actually records show that more traffic accidents and fatalities occur at speeds below 45 miles an hour than above; a large percentage of them happen at speeds below 35 miles an hour.

C. C. Wiley, professor emeritus of Highway Engineering at the University of Illinois, has wryly described the speed situation. He says, "Accident records show that 12 per cent of the fatalities occur at speeds more than 60 m. p. h. Therefore, eliminate speeds above 60 and reduce fatalities 12 per cent. The same record show about 12 per cent of the fatalities occurring at speeds under 20 m. p. h. So, eliminate those low speeds and save another 12 per cent. That would leave 76 per cent between 20 and 60 m. p. h. Eliminate those speeds and get rid of all accidents. The only safe speed limit thus comes out as zero."

The dangerous thing is a rate of movement that is "too fast for conditions." Professor Wiley succinctly summarized the whole matter when he said, "Traffic must move and speed is inherent to movement. It must move rapidly to



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satisfy the demands of transportation because the motor vehicle owes much of its value to its ability to go places quickly."

J. E. P. Darrell, director of Traffic and Planning for the Minnesota Highway Department, states, "We must recognize the difference between dangerous or reckless speeds and merely reasonably fast driving speeds. Certainly we do not defend the first, but the second need not be harmful and is one of the essentials of acceptable traffic conditions."

B. W. Marsh, director, Traffic Engineering and Safety Department, American Automobile Association has said, "Rapid movement with reasonable safety is the goal in transportation. Since fatalities occur at almost all rates of movement, when does the rate become the 'speed that kills,' incompatible with sound transportation? Until this question has been satisfactorily answered, we should not be too dogmatic as to a specific speed limit."

Examples that are used to show drastic traffic accident reduction after a speed limit has been lowered, frequently fail to take all the facts into consideration. In a recent example a 60 m. p. h. limit was reduced to 50 on a section of road where traffic accidents had been unusually high. One year later traffic accidents were down 35 per cent.

But studies showed that the lower limit had not reduced vehicle speeds one bit. There had been an intensive enforcement program and safety educational campaign. Neither the lower speed limit nor the enforcement program had reduced speeds, but the program had made the driving public conscious of the need for caution on this stretch of highway. They did not drive more slowly but they did drive more cautiously.

Another study showed that a series of cities where speed limits had been consistently raised to a realistic level had fewer traffic accidents than before such limits were raised.

Many factors are more important than speed in causing accidents.

Traffic accidents have a definite cause and definite remedy. They are not really accidents at all.

Chance crack-ups—in the main those resulting from a tire or mechanical failure—are only a small percentage of the total. Most accidents result from an accumulation of circumstances which are more than the driver can cope with. For example, a driver approaching an uncontrolled intersection at the same time three other drivers approach it on the other streets has nine decisions to make within a matter of seconds. He must decide which of three possible movements each vehicle will take—straight through, left, or right. A driver who approaches at a reasonable speed has time to decide. But most speed limits would be too fast.

No traffic regulation can compensate for inattention, aggressiveness, pride of power, revenge, haste, condemnation, recklessness, daring and other traits. These are reflected in driving on the wrong side of the road, cutting in, failure to yield right of way, following too close, weaving from one lane to another, stopping too quickly and, yes driving too fast for conditions.

Only traffic signal systems that are sensitive to variable traffic requirements should be used. Fixed time signal controllers, particularly those without programming devices, create untold delay. An example of efficient intersection control came during last year's bus strike in Washington, D.C. Special traffic officers were assigned to regulate hundreds of intersections throughout the city to augment stop signs or traffic signals. This efficient manual control moved much heavier traffic volumes effectively. But, untrained manual control can do more harm than good. This also shows the need of properly staffed and trained traffic police along with traffic law and highway modernization.

Stricter enforcement is needed for many traffic violations formerly considered minor.

Streets are needed for the movement of traffic, and the street space should be used to the maximum of efficiency. On heavily traveled arterials, stopping, except for emergencies, should be a gross violation of the law.

Drivers should not be permitted to drive too slowly. They are often more of a menace than fast drivers.

Many drivers smugly feel that they are the only safe drivers in the traffic stream because they leave four car lengths between themselves and the car ahead even though two would be enough. If each car took up twice as much room on the street as it needed, think of the congestion.

The driver who holds back when approaching a red light is also using street space unnecessarily.

Changing from one lane to another if done with caution should not be condemned. Moving into a less congested lane makes better use of street space, fills up a less used lane and leaves a space in the lane just left for the traffic behind.

Restriction of left turns and also, where there are pedestrians, right turns, is vital in expediting traffic flow through critical areas.

In short we need to get rid of outmoded concepts of traffic and enforcement if the expanded road building program is to accomplish the purpose for which it is intended.

The future of automotive transportation can be bright if we match dollars for roads with realistic traffic regulations. The green light is due for a longer interval.

STOP
STOP ACCIDENTS!
INCREASE SAFETY!
Yes, you can buy SAFETY ON THE ROAD with the right signs and equipment—built for lasting service.
New RED STOP SIGNS
Provide quick identification — day or night. Approved Joint Committee on Uniform Traffic Devices. 16 gauge zinc coated steel or .081" aluminum. 24" x 24" size.
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These 6' x 8' and 3' x 4' signs are easily seen hundreds of yards away from construction areas . . . allow motorists ample warning and provide extra safety for your men. Reflectorized, steel with wood framing, weather-proofed, and road tested. Write for quotation on special signs.
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CONSTRUCTION AT INTERSECTION
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NEW YORK STATE DEPT OF PUBLIC WORKS
CAUTION MEN WORKING
E-Z BARRICADE
All-steel. Sets up easily and quickly wherever hazard conditions exist. Portable, highly visible. Variety warning signs. 4', 6' and 8' lengths. 34" high.
R R
ONE WAY
NO PARKING HERE CORNER
20 MPH
SLOW
SPEED LIMIT 30 MPH
HIGHWAY AND TRAFFIC SIGNS—
Hundreds of standard and special legends.
Write for complete legend listings and prices TODAY. You'll like dealing with one source of supply for all your safety needs.
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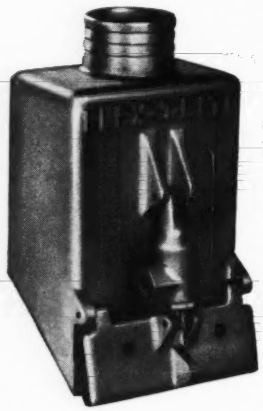

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A Major Street System Planning Procedure

By William S. Pollard, Jr. (Assoc. Mem., ITE)

Junior Associate and Chief Engineer, Harland Bartholomew and Associates, St. Louis, Missouri

THAT THE AMAZING GROWTH in vehicular registration, the increase in vehicular usage, the continuing migration of people to cities and the over-all growth of our population have resulted in more traffic movements within our cities than ever heretofore experienced is a matter of simple fact. That many cities have not been able to keep pace with this increase in traffic is evidenced through the increased congestion and attendant delay presently experienced by and daily becoming more aggravated within these cities. Our cities are doing everything within their power to alleviate the condition they face: one-way street systems have been inaugurated; reversible lanes, even reversible streets, have been brought into play; expressways have been built; new major streets have been opened; existing major streets have been widened; grade separations have been built; signalization has been improved; long-range street improvement programs have been adopted; in short, the problem is under attack.

The purpose of this paper is to set forth one of the procedures used by the author's firm in preparing the major street plan, one of the more significant phases of a comprehensive plan for a city. In brief, the procedure involves a projection and analysis to determine future trip desire lines and volumes, a selective reduction of these desires to peak hour volumes, a selective assessment of present peak hour capacities, the determination of future deficiencies in capacity by location, and finally, a proposed major street system so located and of a capacity sufficient to meet these deficiencies. To simplify the presentation, a sequential or "cookbook" style has been adopted. The steps are:

1. Perform detailed land use study and prepare land use map. This study provides one important basis of analysis for estimating desirable future land use, in addition to providing basic data for the determination of present population distribution and density. The more accurate this map and the more detailed this study, the more meaningful are the values which depend upon derived data therefrom. In the preparation of a comprehensive plan our normal land use procedure involves the field checking of every parcel of property within the city and the outlying areas in reasonably close proximity to the city, the latter to insure having checked all possible future growth directions during the period of the plan (generally twenty-five years ahead). Figure 1 is a generalized land use map.

2. Prepare detailed existing population distribution and density maps. These are based upon the detailed present land use maps supplemented and checked by building permit data and data obtained through the U. S. Census Bureau. The distribution of present population is compiled in large-scale map form to allow for its convenient later use. Although the intensity of the dots on the population distribution map indicates the population density in graphic form, it is normal to prepare a separate population density map which, by various shadings, presents the population density in persons per acre. This map, of which Figure 2 is an example, is of assistance in the determination of desirable locations and categories of future land use.

3. Prepare a future generalized land use map. Involved here is a complex analysis predicated upon such factors as the estimated future population, desirable population densities, the desire to create a balanced relationship among all of the functional and recreational requirements of the community, the topography, present zoning regulations, present transportation facilities, and other influencing factors. This map provides the necessary guide for the preparation of zoning district maps and a new or revised zoning ordinance, the combined aim of which is to help the city insure the orderly realization of future land uses compatible with the uses deemed most beneficial to the city as a result of the study. The right-hand portion of Figure 1 is a typical future land use map.

4. Prepare a future population distribution map. This involves an analysis of past population trends in the city, in the area surrounding the city, in the state, in the region, and in the nation. A number of prediction procedures are utilized, their values compared and, through an assessment of factors related to the particular city under study, one of the projections (or an average of more than one projection) is accepted as being representative for planning purposes. The total estimated population for the date of the plan having thus been determined, the future distribution and density of this population over the city is estimated on the basis of proposed zoning regulations, the future land use map, utility and economic considerations and other related factors. The future population distribution map (Figure 3) when used in conjunction with the present population distribution map, the present land use map (Figure 1), and the future land use map (Figure 1), and other data to be described subsequently provides the basis for determining the future trip desire lines and volumes for ultimate analysis.

5. Prepare a tabulation and graph showing trends in vehicular ownership per capita from a period of approximately three decades past to the present for the city being studied, for the surrounding county, for

the state, for the region, and for the nation. Extrapolation and comparison of these values permits estimating the future vehicular ownership per capita on an entire-future-city basis. In order to provide a basis for determining the future trip desire lines and volumes, the future vehicular ownership per capita is computed on a differential basis for various parts of the city, the basis of differentiation being essentially that of general income level (as inferred from future land use and zoning data) and location.

6. Prepare a tabulation and graph showing trends in vehicular usage (in miles per vehicle per year or other related terms) covering the same space of time as the vehicular ownership figures and having the same coverage of political units. Extrapolation and comparison of these values permits the estimation of future vehicular usage in miles per vehicle on an entire-future-city basis. As with the vehicular ownership per capita figures, in order to provide a basis for determining the future trip desire lines and volumes it is necessary that the usage figures be computed on a differential basis for various parts of the city; in this case the primary basis of differentiation is location, although general income level is again a related item.

7. Prepare map showing future trip desire lines and volumes. Depending upon what basic traffic data is available, the procedure for determining these desire lines and volumes must, of necessity, vary somewhat. For the purpose of example, it is assumed that past and current traffic volume data plus a fairly recent origin-destination study are available (the most ideal case). The procedure follows:

a. Divide future urban area (as predicted by future land use map) into zones, the size and location of these zones being determined on the basis of relative size, character of use, and population so as to be as nearly comparable as possible with the zones of the original origin-destination study.

b. Outline each zone on an overlay sheet to the scale of the present and future population distribution maps. Within each of the zones on this overlay note the present and future population figures, the present and future vehicular ownership per capita figures, and the figures representing present and future vehicular usage. Each of these sets of figures is reduced to a ratio, representing the estimated increase or decrease in each item expected by the design date. Since the effect of these factors is cumulative as regards traffic generation, a factor representing the ratio of estimated future desires to present desires from the zone is obtained as a product of the registration and usage factors.

c. For each zone of the existing origin-destination study determine the present number of movements per capita per day, using total movements across the zone boundaries and the present population figures per zone. For industrial zones (or zone portions) and for the central business district zones and

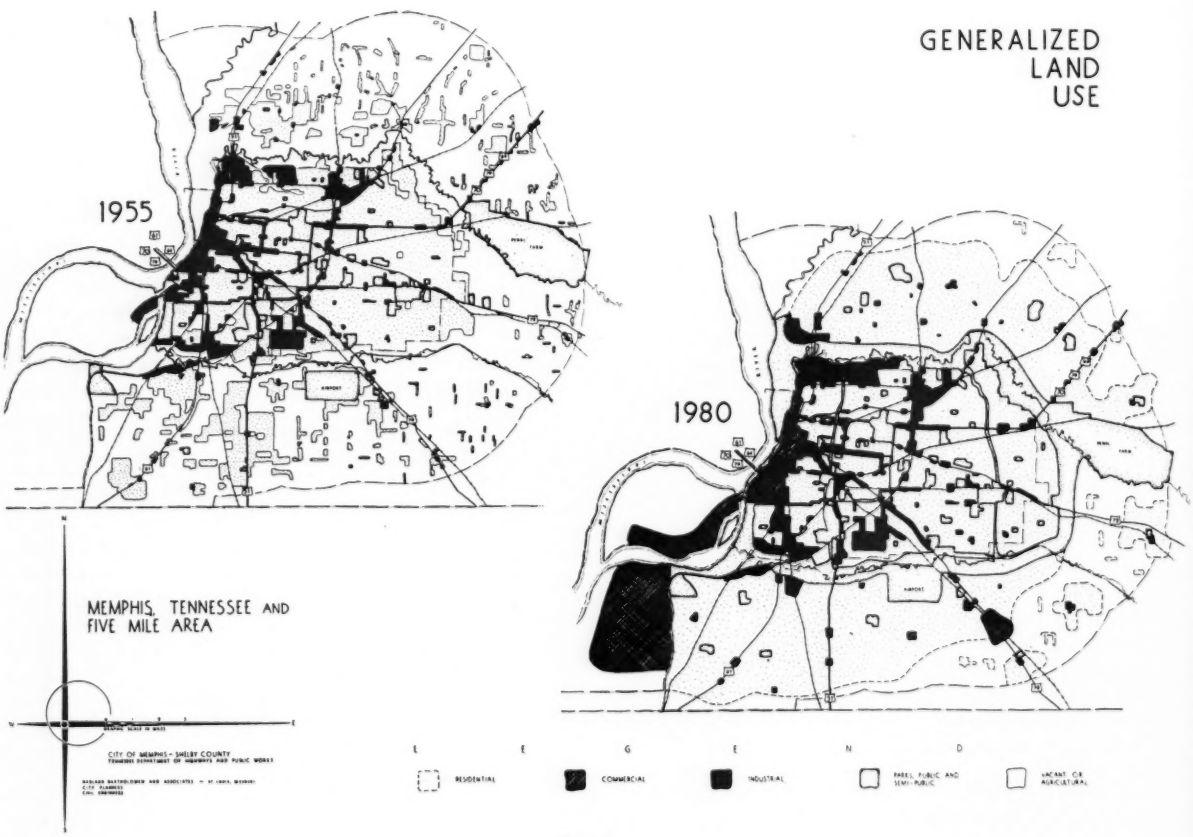

Figure 1
Typical Generalized Land Use Maps

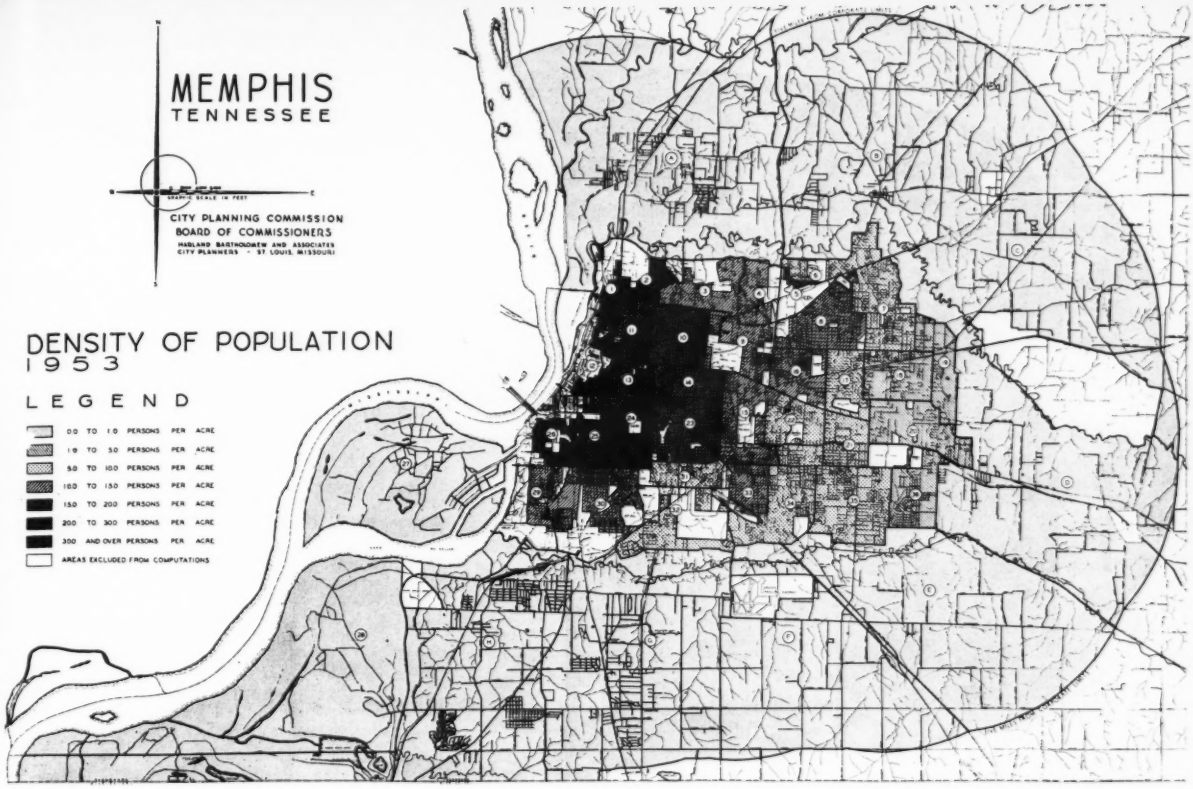
MEMPHIS
TENNESSEE
CITY PLANNING COMMISSION
BOARD OF COMMISSIONERS
HARLAND BARTHOLOMEW AND ASSOCIATES
CITY PLANNERS - ST. LOUIS, MISSOURI
DENSITY OF POPULATION
1953
LEGEND
0.0 TO 1.0 PERSONS PER ACRE
1.0 TO 5.0 PERSONS PER ACRE
5.0 TO 10.0 PERSONS PER ACRE
10.0 TO 15.0 PERSONS PER ACRE
15.0 TO 20.0 PERSONS PER ACRE
20.0 TO 30.0 PERSONS PER ACRE
30.0 AND OVER PERSONS PER ACRE
AREAS EXCLUDED FROM COMPUTATIONS

Figure 2
Typical Population Density Map

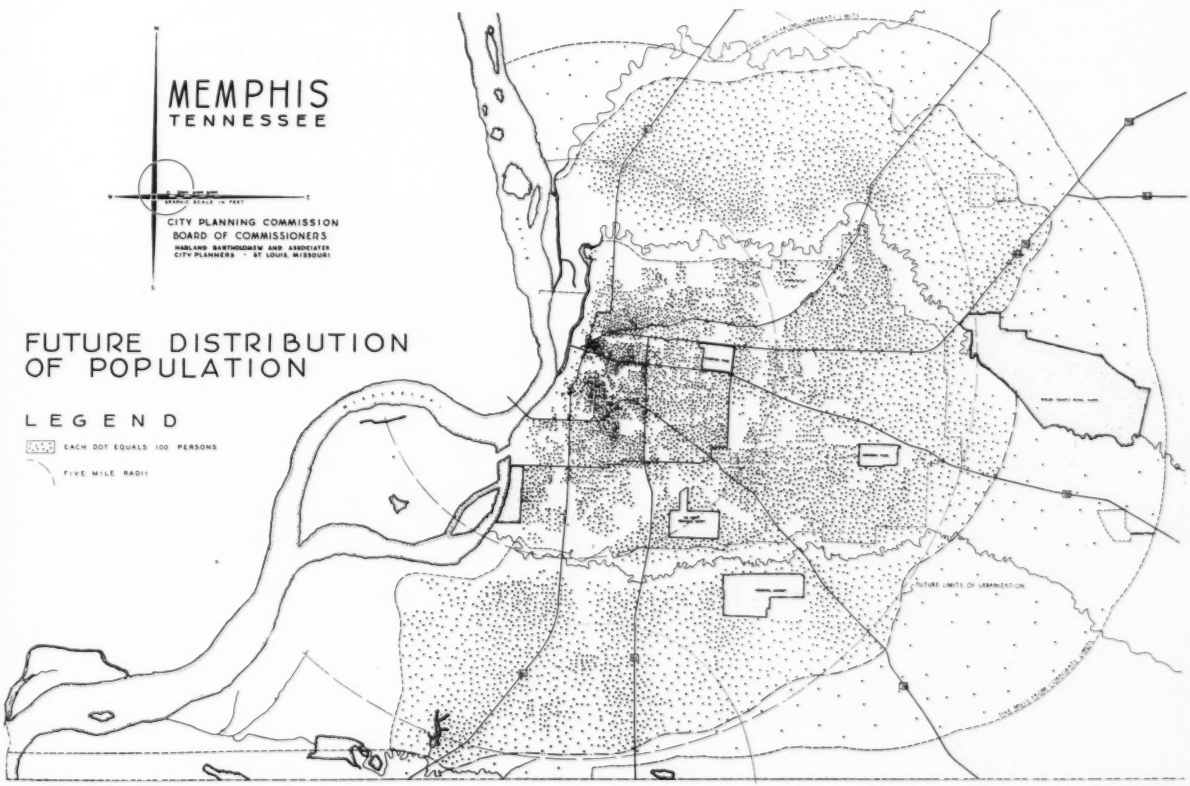

Figure 3
Typical Future Population Distribution Map

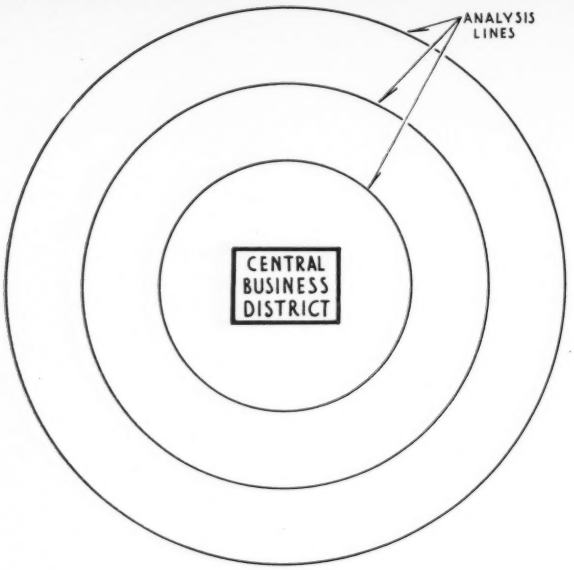

Figure 4
Typical Analysis Lines for Radial Movements

other major commercial zones (or portions) the number of movements per day is also computed on the basis of units of area, since this is more representative of traffic generating potential.

d. Expand the traffic generation per capita per zone on the basis of the combined registration-usage increase factor and apply the figure so obtained to the estimated future population in order to obtain the estimated future total traffic generation for each zone. For industrial and commercial zones this expansion is made by applying an over-the-city factor of registration-usage increase to determine the future traffic generation per unit of area and then applying this estimate of future traffic generation to the zones (or portions) predicted by the future land use map to be in this usage. It is presumed that the growth of industry and commerce will roughly parallel over-all population growth within the city; therefore, the expansion of industrial and commercial traffic generation does not include a population factor per se.

e. Utilizing the present and future land use maps along with present and future population density maps in order to establish the relative comparability of zones, using the present origin-destination study as a guide to percentage and extent of movements from present zones to major foci and to other zones, and utilizing the future traffic generation per zone to establish the total movements to be accounted for in each zone future traffic desire lines and volumes are established and plotted among zones. It is significant to note here that movements between contiguous zones below a certain level (the level is somewhat arbitrary and depends upon both the relative traffic volumes within the city and the size of the city, these items themselves being definitely related) are dropped from direct consideration on the premise that, since the ultimate analysis utilizing the diagram being prepared is one of the major street and highway system, these lesser movements will be accommodated on minor streets. Through movements on the diagram are obtained by expanding present through movements on the basis of regional or national registration-usage-population increase factors and are located by interconnecting extensions of the present entry points to their probable future location at the limits of estimated future urban growth; tentative locations of obviously needed new facilities such as bridges or new highways are approximately located and certain of the through traffic is distributed to them.

8. Analyze principal future traffic movement desires (to and from central business district, crosstown, radial, to and from major industrial focus areas, circumferential, through and interzonal other than those just given) as follows:

a. Obtain information as to peaking characteristics of traffic on major streets and highways within the city and note this information on a map at the various points over the city for which data exists, noting the average peak hour traffic as a percentage of the average daily traffic and the directional distribution of the peak hour traffic as a percentage by directions.

b. Inventory all present major streets and highways, noting information as to width of right-of-way, pavement width, number of moving lanes, number of parking lanes, traffic control devices, and other data indicative of both the present capacity and the capacity increasing potential.

c. Compute the hourly one-directional capacity of all major streets and highways.

d. Prepare analysis overlays for the future desire line and volume chart; separate overlays may be prepared to analyze each principal set of future traffic desires.

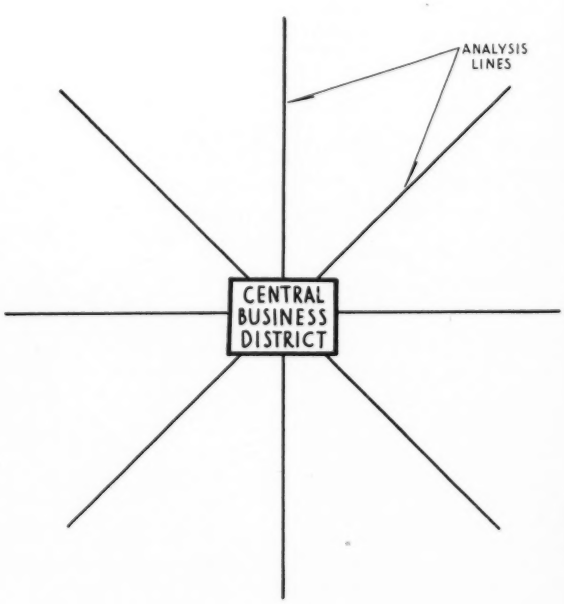

Figure 5
Typical Analysis Lines for Circumferential Movements

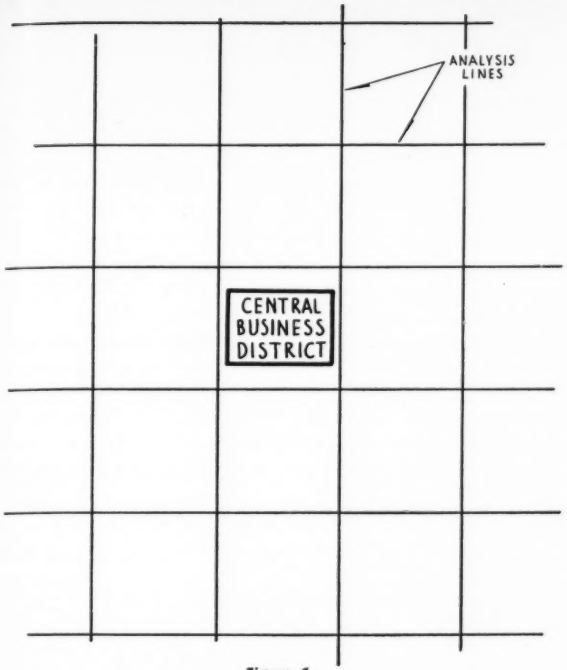

Figure 6
Typical Analysis Lines for Cross-Town Movements

A series of analysis lines is drawn on the overlay. These lines might be termed multi-cordon lines or multiple screen lines. Figures 4, 5 and 6 are generalized indications of analysis lines appropriate to the type movement noted in their respective captions. The distance between analysis lines is a matter of judgment and depends largely upon the size of the city; as a generality for a city of approximately 500,000 or greater present population, the distance between analysis lines should average no more than a mile, being closer together in complex areas of high traffic flow and farther apart in outlying areas.

e. Starting with the overlay for the radial resires to and from the central business district, scale the future desire volume at the intersection of each radial desire line with an analysis line, reduce this to the peak hour volume in the major direction and plot it to scale on one side of the analysis line (see Figure 7).

f. From the previously computed street capacity data, plot the one directional capacity of each street oriented so as to serve the movements under consideration; these values should be plotted to scale and centered on the location of the street at its intersection with an analysis line and should be placed on the side of the analysis line opposite to the desire peak data.

g. From this point on the analysis procedure becomes rather obvious. The capacity of each present street is assigned to the most logically served future peak desire on each analysis line, a check off of the street at each such location is made to indicate having so absorbed its capacity, and a scalable peak hour capacity deficit (or overage) remains.

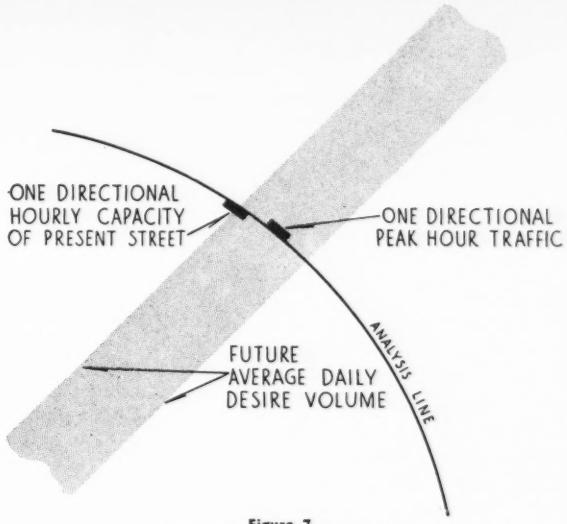
ONE DIRECTIONAL HOURLY CAPACITY OF PRESENT STREET
ONE DIRECTIONAL PEAK HOUR TRAFFIC
FUTURE AVERAGE DAILY DESIRE VOLUME
ANALYSIS LINE

Figure 7
Detail of Typical Analysis Line

These capacity deficits are connected and the analysis sheet then represents capacity deficits by location and volume. Steps e, f, and g are then repeated for other principal movements, the resultant overlays overlaid upon each other and a composite future capacity deficit chart is obtained to guide the further development of a major street and highway plan.

Since the intent of this article is essentially that of describing an analytical procedure in fairly general terms, no attempt has been made to discuss or even itemize the many considerations other than those touched upon herein which must be carefully considered in the final recommendation of a future major street and highway plan.

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The Occasion: 26th Annual Meeting, ITE

— Make Your Plans Early —

Traffic News

National Joint Committee Reports on Sign, Signal and Marking Standards

The National Joint Committee on Uniform Traffic Control Devices met last winter and first in open meeting and later through written ballot approved a number of proposals relating to standards for signs, signals and markings. The Committee did not recommend any changes in the Manual on Uniform Traffic Control Devices, so formal approval by any of the sponsoring agencies was not requested.

The specific action taken by the Committee is reported below:

1. Recommendation that, as an alternate to the horizontally elongated ONE WAY sign, the Manual provide also for a sign designed as a vertical rectangle.
2. Recommendation for elimination of circular WALK and WAIT pedestrian signals, and approval of only rectangular box-type signals.
3. Recognition, under paragraph 8 of the Governing Rules, of the desirability of further experimentation and research on the flashing school speed limit sign and on similar changeable signs for other applications.
4. Recognition of the desirability of further experimentation and research on the shape of the Yield Right of Way sign, including enlargement of the triangle (if used) to a minimum of 36 inches on a side.
5. Acceptance of the proposed *Manual of Signs, Signals, and Markings for Highway Construction Work* as an interim working manual, to be referred to the Subcommittee on Signs for completion.
6. Recognition of the 12-inch traffic signal lens as worthy of research, as a permissible alternate to the 8-inch lens where a special need exists.
7. Recommendation that the Manual authorize the use of portable traffic signals under specified temporary circumstances, provided that all standards applicable to permanent installations shall apply, except as to the required number of signal faces.
8. Acceptance of the "Evacuation Route" sign, of the Federal Civil Defense Administration, for inclusion in the next revision of the Manual.

NHUC Elects New Chairman

William S. Richardson, President of The B. F. Goodrich Company, was elected Chairman of the National Highway Users Conference, succeeding Albert Bradley, Chairman of the Board of General Motors. Mr. Bradley has served as NHUC Chairman since 1948.

Other officers reelected were Arthur M. Hill, Chairman of the Executive Committee of the Greyhound Corporation and President, National Association of Motor Bus Operators, and Herschel D. Newsom, Master of The National Grange, Vice Chairmen, and Louis J. Taber, Chairman of the Board, Farmers and Traders Life Insurance Company, Secretary-Treasurer.

The National Highway Users Conference is made up of more than 1,500 national, state and local highway user groups. Among these are State Highway Users Conferences, which are autonomous groups located in every state.

Baltimore Dials Parking Time

The return of big league baseball to Baltimore added a few more headaches for the traffic engineering staff. As usual, however, the profession rose to the occasion and came up with an answer.

The problem revolved around getting the maximum capacity out of narrow streets leading to and from the Memorial Stadium. One-way regulations had to be set up, and parking prohibitions created, but these regulations were only necessary when events were scheduled in the Stadium. Sometimes events were afternoon affairs, and sometimes night. It was important to obtain the maximum amount of flexibility in control measures.

The solution was the invention of a folding sign which could be opened when its message was needed. The prize feature of the sign, however, are revolving discs to establish the beginning and ending hours for the special restriction.

The idea works, for crowds at the Stadium are moved out smoothly and relatively quickly. Made of 14-gauge aluminum, the signs are giving trouble-free service.

USE OF "CHILDREN AT PLAY" SIGNS

The following bit of whimsy is from the pen of Basil Andrews (Assoc. Mem., ITE), Traffic Engineer of Contra Costa County, California. It just proves that a traffic engineer's life is not all work. — EDITOR.

There are many advisable uses for "Children At Play" and similar signs. There is a wide variety of legends such as "Don't You Kill A Child," "Children Crossing," "Slow Children" and many others. There is also a wide variety of shapes, sizes, and colors. As will be explained later, these variations are an advantage rather than a disadvantage.

Very often signs of this type are painted on masonite or plywood. These materials are not very resistant to weathering but are quite useful for many purposes not requiring outdoor exposure. Boy Scouts and similar groups can always use masonite or plywood for a wide variety of handicraft projects. The sizes of most signs are quite suitable for many of these. Any man with a home workshop is glad to have pieces of these materials around and can often use them where the sign legend will not show.

Much more durable, but in some ways harder to handle, are porcelain enamel signs. They cannot be cut without chipping and subsequent rusting. Even so, I have found them useful in several ways. By driving several of them into the ground edge-to-edge I made a low wall in my back yard. Redwood stakes at the junctions keep them in line and make a neat appearance. A porcelain enamel sign makes a good lid for an old oil drum, whether you use it for an incinerator, a trash can, or something else.

Of course there is the obvious fact that "Children At Play" and similar signs may be used for traffic purposes. If they are of suitable material, in good condition, and of appropriate size and shape they may be refinished as a standard type traffic sign. One simple use which can tolerate quite a little variation in size, is to cover the face, or as much of it as desired, with red reflective sheeting and use it as a W21R. In rural areas these get shot at less than the type with plastic buttons.

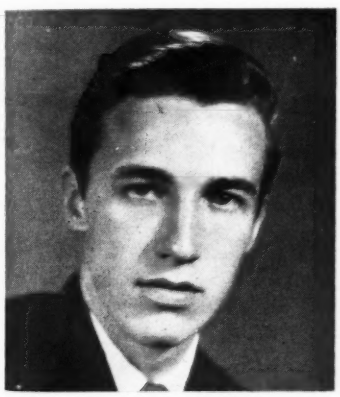
It is a big mistake to write "Children At Play" signs off as useless, because the wide variety of sign shapes and materials makes it easy to find many valuable uses in addition to those mentioned here.

New Appointments

Bacchus Accepts New Position

Grant A. Bacchus (Jr. Mem., ITE) has accepted a position with the Metropolitan Toronto Planning Board as Assistant Traffic Engineer of the Transportation Division. He will work under the supervision of Raymond J. Desjardins (Jr. Mem., ITE) who is Traffic Engineer, and Murray Jones (Canadian Section, Affil. Mem., ITE) who is the Director of Planning Board.

Grant was previously the Route Analysis Engineer with the Ontario Department of Highways and has served in that capacity for the past four years.



Grant A. Bacchus

While an undergraduate at the University of Toronto, Grant worked summers for the Ontario Department of Highways in highway construction, surveying, and traffic engineering. He obtained his Bachelor's degree in Civil Engineering from the University of Toronto in 1951.

In addition to being a Junior Member in the ITE, Grant belongs to the Association of Professional Engineers of Ontario and the Canadian Good Roads Association. Grant is one of the most active younger members in the Institute serving as Secretary-Treasurer of the Canadian Section, Editor of the Canadian Section Newsletter and an Associate Editor of TRAFFIC ENGINEERING Magazine. He is also on the Traffic and Planning Committee of the Ontario Traffic Conference and has presented lectures in the Ontario traffic training course.

Cysewski Goes With Consultant

G. R. Cysewski (Assoc. Mem., ITE) has recently joined the John Graham and Company, architect-engineers, Seattle and New York, as Director of Traffic and Highway Engineering.

Cysewski's work embodies all phases related to traffic and highway engineering including analysis of traffic potential by various commercial developments. capacity studies; design of traffic control devices, including signals, channelization and charges. He also represents clients in negotiating highway treatment necessary to accommodate added traffic generated by various commercial developments. Previous to this new appointment he was District Traffic Engineer for the Washington State Department of Highways and located in Seattle.

G. R. Cysewski

He was born in Jamestown, North Dakota and graduated from high school there where he was active in athletics. In 1936 he entered the University of Washington and graduated with a Bachelor of Science Degree in Civil Engineering. In addition to his academic work, he played several years of football at the University.

Cysewski is married and has three children; Gerald, Jr., 7; Brian, 6, and Marla Gayle, 2.

During the war he was commissioned an officer in the United States Navy and was assigned to the staff of Command Service Forces of the Pacific Area. He attended diving school and was qualified as a salvage officer.

From 1946 until he accepted this new position, he had been with the Washington State Department of Highways in bridge design and traffic engineering. He received a one-year leave of absence to attend the Yale Bureau of Highway Traffic. He is a licensed professional engineer in civil and structural engineering and has served in a consulting capacity to cities, counties and consultants.

LOOKING AHEAD

SEPT. 17-19—MACKINAC ISLAND, MICHIGAN
National Highway Conference of County Engineers and Officals, American Road Builders' Association, Grand Hotel.

SEPT. 17-20—ST. LOUIS, MISSOURI
Annual Meeting, American Transit Association, Jefferson Hotel.

SEPT. 17-20—DENVER, COLORADO
Annual Convention of the International Municipal Signal Association, Cosmopolitan Hotel.

SEPT. 17-21—BOSTON, MASSACHUSETTS
National Technical Conference, Illuminating Engineering Society, Statler Hotel.

SEPT. 24-27—SAN FRANCISCO, CALIF.
Annual Meeting of the Institute of Traffic Engineers, Mark Hopkins Hotel.

SEPT. 30-OCT. 2—DENVER, COLORADO
Fall Convention and Co-Exhibit of the American Congress on Surveying and Mapping and American Society of Photogrammetry, Shirley-Savoy Hotel.

OCT. 2-5—COLUMBUS, OHIO
Annual Short course on Roadside Development, Ohio Department of Highways.

OCT. 22-24—NEW YORK, N. Y.
Annual Meeting, American Standards Association (in conjunction with National Conference on Standards), Hotel Roosevelt.

OCT. 22-26—CHICAGO, ILLINOIS
National Safety Congress & Exposition, National Safety Council, Congress Hotel.

Institute Affairs

Board Meets With Western Section

The Board of Direction met May 25 and 26 in Denver, with arrangements made by the Inter-Mountain Area of the Western Section. Al Pepper, as V-P of the Western Section, was responsible for the planning, but he had the assistance of a fine local committee, including Jack Bruce from Denver and some of his people. A feature of the meeting was a dinner of the Section at which Board members were guests of honor.

Full Agenda Considered by Board

The Board, with all eleven members present, tackled a long agenda and finished it the afternoon of the second day. Many items of interest to the membership were considered—including the review of sixty-six reports from the Membership Committee on applications for admission or transfer. Of these, the Board approved 23 transfers to a higher grade and 35 new members. The latter bring total membership to 995, and four affiliate invitations voted will make the total 999. The names of the new members and transfers are shown elsewhere in this issue.

Two new sustaining organizations were approved, and invitations are going out to them. They are: Aluminum Company of America, Pittsburgh, Pa.; and Flex-O-Lite Manufacturing Corporation, St. Louis, Missouri.

Institute Activities Reported to Board

The Institute had a prominent part in the Regional Conferences called by the President's Committee for Traffic Safety, it was reported by President Prisk.

A full report of the Work Conference held in Pittsburgh preceding the last Annual Meeting has been developed and will be circulated to those in attendance. A popular version will be prepared, it was decided, for general distribution.

Considerable discussion was held on membership questions, with a report from the Midwest Section read and referred to the Board's Membership Committee. Of particular concern is the problem of students and those beginning the practice of traffic engineering, and how to smooth the way for their affiliation with the Institute. Also discussed was the question of life membership, a problem given to the Membership Committee for further study.

The Headquarters Staff Committee reported on its work to date and suggested some personnel policies for headquarters staff (vacations, terminal pay, etc.) which the Board approved.

T. E. Award Plan Reviewed

The change in the basis for awards made by the National Safety Council in connection with the Annual Inventory of Traffic Safety Activities has necessitated reconsideration of the Institute's awards for traffic engineering performance. The Board decided that awards would be made by the Institute in 1956 and approved criteria to be used by a board of judges to be appointed by the President.

A committee was appointed to give further thought to the matter of awards in the years to come, with a request that a report be presented at the January board meeting.

New Section Authorized

A petition was presented to the Board from a number of Institute members in Pennsylvania and Delaware, requesting authorization for the formation of a new section. The Board voted approval but suggested that the proposed name "Middle Atlantic States Section" was perhaps too broad. The petitioners were instructed to discuss with the New York Metropolitan Section matters of boundary lines, rosters and section name before submitting a proposed constitution for approval.

Annual Meeting Plans Approved

A preliminary program for the annual meeting in San Francisco was presented to and approved by the Board. Although details are not final enough to be reported here, the schedule of events includes registration on Monday, September 24, and a Western Section meeting on that same day. Two technical sessions are planned for Tuesday, a technical session and a field trip for Wednesday, and the annual business meeting and a fourth technical session on Thursday. The annual banquet is tentatively scheduled for Thursday night.

One change approved by the Board for this year's meeting was the appointment of a resolutions committee in advance of the meeting with instructions to report proposed resolutions to the Board of Direction at their meeting just preceding the convention.

Traffic Engineering Handbook

Appointment of the Editorial Board for the proposed revision of the Traffic Engineering Handbook was reported, with acceptances received from the following:

Robert A. Mitchell	Eugene Maier
Donald M. McNeil	George Howie
Harmer Davis	James Darrell
Fred Hurd	J. C. Young

O. K. Normann

Pending a meeting of the Board, Mr. McNeil is serving as temporary secretary. One of the first tasks of the group is the selection of an Editor and a Secretary.

Considerable discussion was devoted to various methods of financing the Handbook. Three possible methods were considered: 1) renewal of the cooperative arrangement with the Association of Casualty and Surety Companies; 2) a contract with a publishing firm, resulting in royalties for the Institute, and 3) a contract with a printer and binder, with the Institute becoming the publisher. Relative advantages, financial and otherwise, of the various methods were discussed but no decision was reached. The Board voted that the financing of the revised edition of the Handbook be a matter for further investigation.

Institute Represented on Matson Award Board

The Board voted to accept an invitation for the Institute to participate in the Board of Award of the Matson Memorial Fund. The President was authorized to appoint a representative to serve a 3-year term.

Two Board Committee Reports Presented

A report from a Board committee dealing with joint Board-Section meetings was presented and referred to members of the Board for study. Also presented was the long-awaited manual on conduct of annual meetings. Designed to be a guide for local committees, this report will now be considered at the next meeting after study by Board members between now and then.

Make Your Reservations Early for San Francisco

It is not too early to make your reservations for San Francisco. Remember the dates — September 25 to 27. Registration will start on Monday, September 24, so plan to check in that day if at all possible.

See you in San Francisco!

New Members and Transfers

Elected by Board of Direction May 25, 1956.

TRANSFERS

ANDREWS, Basil R. (Associate)
Engineer, Traffic Division
Contra Costa County
Martinez, California

AVERY, Eugene V. (Associate)
City Traffic Engineer
St. Paul, Minnesota

CAMPBELL, Earl W. (Associate)
Chief Traffic Engineer
Chicago Area Transportation Study
Chicago, Illinois

COGGER, George E. (Associate)
Senior Traffic Engineer
Dallas, Texas

FEDERHART, James W. (Associate)
Traffic Engineer
Saginaw, Michigan

FREDRICKSON, Charles B. (Associate)
Assistant Traffic Engineer
Long Beach, California

GALLOWAY, Thomas R. (Associate)
Traffic Engineer
Hazelet & Erdal
Cincinnati, Ohio

GOLDIN, Alfred K. (Associate)
Assistant District Traffic Engineer
California Division of Highways
Los Angeles, California

HAGENAUER, George F. (Member)
District Engineer of Research and Planning
Illinois Division of Highways
Chicago, Illinois

HALVERSON, James R. (Associate)
Chief Traffic Engineer
Utah State Road Commission
Salt Lake City, Utah

HARTLEY, John E. (Associate)
City Traffic Engineer
Flint, Michigan

KAISER, Fred J., Jr. (Associate)
City Traffic Engineer
Racine, Wisconsin

KELLY, Robert J. (Associate)
Commissioner of Traffic Engineering and Parking
Cleveland, Ohio

KUPEL, Vernon T. (Associate)
Engineer, Bureau of Traffic
Illinois Division of Highways
Carbondale, Illinois

OLMSTEAD, Evan E. (Member)
Traffic Engineer
Chicago Transit Authority
Chicago, Illinois

RICE, Paul W. (Member)
Director of Traffic Engineering
Corpus Christi, Texas

RUDDEN, James B. (Associate)
Assistant Traffic Director
Baltimore, Maryland

STRICKLAND, Richard I. (Member)
Assistant Chief, Traffic Division
Port of New York Authority
New York, N. Y.

WALONS, Richard A. (Associate)
Traffic Engineer
Bureau of Street Traffic
Chicago, Illinois

WARR, Robert H. (Associate)
Associate Engineer
Traffic Engineering Division
Seattle, Washington

WILLIFORD, Robert E. (Associate)
Port of New York Authority
New York, N. Y.

ZELL, Charles E. (Associate)
Associate Highway Engineer
California Division of Highways
Sacramento, California

NEW MEMBERS

BLAKELY, William J. (Junior)
Planning Engineer
Corp. of District of Burnaby
South Burnaby, B.C., Canada

BOESEL, John L. (Junior)
Senior Civil Engineering Assistant
Los Angeles County Road Dept.
Los Angeles, California

BOSSI, Alfred A. (Junior)
Assistant Traffic Engineer
County of Alameda
Oakland, California

BROWN, James L. (Junior)
Traffic Signal Engineer
Denver, Colorado

BURBIDGE, Eugene A. (Junior)
Engineer in Training
Idaho Department of Highways
Boise, Idaho

CHESTER, Robert C. (Junior)
Traffic Engineer
Lubbock, Texas

CROWELL, Donald R. (Junior)
Traffic Engineer
Bureau of Street Traffic
Chicago, Illinois

DeARMON, Charles W., (Junior)
Engineer, Division of Traffic Engineering
Dayton, Ohio

DIERSTEIN, Philip G. (Junior)
Assistant City Engineer
Champaign, Illinois

FLYE, William D. (Junior)
Design Engineer
Department of Public Works
White Plains, New York

GARVER, Mark G. (Associate)
Partner, Garver & Garver, Engineers
Little Rock, Arkansas

HEFRON, Roscoe E., Sr. (Member)
Highway Traffic Analyst
Michigan Highway Dept.
Lansing, Michigan

HEYWOOD, H. Milton (Junior)
Traffic Design Engineer
Department of Traffic Engineering
Baltimore, Maryland

KISSELEFF, Louis G. (Junior)
Traffic Engineering Survey Analyst
Colorado Highway Dept.
Denver, Colorado

KOLTNOW, Peter G. (Junior)
Graduate Student & Sr. Engineering Aide
University of California
Berkeley, California

LARSON, Robert A. (Junior)
Highway Planning Engineer
Oakland County Planning Commission
Pontiac, Michigan

LEITCH, Kenneth (Junior)
Deputy Traffic Engineer
Melbourne, Victoria, Australia

LESSIEU, Eugene J. (Junior)
Planning Technician
Port of New York Authority
New York, New York

LOTSPEICH, Marvin W., Jr. (Junior)
Assistant Traffic Engineer
Spokane, Washington

MANNING, John I. (Junior)
Assistant Traffic Planning Engineer
Philadelphia, Pennsylvania

McLEAN, Charles H. (Junior)
Traffic Engineer
Bureau of Street Traffic
Chicago, Illinois

MILLER, Charles D. (Associate)
Engineer of Traffic and Planning
Indiana State Highway Dept.
Indianapolis, Indiana

MILLER, John V., Jr. (Associate)
Highway and Traffic Engineer
Richardson, Gordon and Associates
Philadelphia, Pennsylvania

NEWTON, John T. (Provisional Junior)
Signal Engineer
Municipality of Metropolitan Toronto
Toronto, Ontario, Canada

PAYNE, Junius H. (Associate)
Assistant Engineer
Florida State Road Dept.
Tallahassee, Florida

POTENZA, Fred, Jr. (Junior)
Traffic Engineer
Chicago Motor Club
Chicago, Illinois

POWARS, Lowell A. (Associate)
Traffic Engineer
Dade County Commission
Miami, Florida

RAMOS, Irineo S. (Associate)
Traffic Research Engineer
Bureau of Public Highways
Manila, Philippines

RAY, James C. (Junior)
Student
Institute of Transportation & Traffic Engineering
University of California
Berkeley, California

SANSOM, Frederick J. (Associate)
Traffic Engineer, Grade 2
Municipality of Metropolitan Toronto
Toronto, Ontario, Canada

SCOTT, Clyde W. (Junior)
Assistant City Planner
Cleveland, Ohio

SHOCKEY, Jack W. (Junior)
Associate Traffic Engineer
Denver, Colorado

THORPE, Vernon R., (Associate)
Public Works Director & Chief Engineer
Medford, Oregon

VANNICE, Robert E. (Junior)
Assistant Structural Engineer
Cuyahoga County
Cleveland, Ohio

WHISTON, Edward G. (Junior)
Highway Engineer
Cook County Highway Dept.
Chicago, Illinois

Position Available

CITY OF PHOENIX, ARIZONA

Assistant Traffic Engineer

The assistant traffic engineer in Phoenix has both professional and administrative responsibilities. He is responsible for the individual application of engineering principles and techniques in the solution of traffic problems and for the initiation and development of long range traffic planning. Required is considerable progressively responsible experience in traffic engineering and graduation from a four year college or university with specialization in traffic engineering. Salary range is $460.00 to $575.00 depending upon the qualifications. Starting salary could be $500.00 per month.

Apply to Leroy J. Brenneman, Personnel Director, City Hall, Phoenix, Arizona.

ITE Sustaining Organizations

A'G'A Division of
Elastic Stop Nut Corporation of America
1027 Newark Avenue — Elizabeth 3, New Jersey
Attention: Mr. Irving J. Mack
Sustaining Organization Representative

Aluminum Company of America
Alcoa Building — Pittsburgh 19, Pennsylvania
Attention: Mr. M. R. Schuster
Sustaining Organization Representative

American Transit Association
292 Madison Avenue — New York 17, New York
Attention: Mr. George W. Anderson
Sustaining Organization Representative

Automatic Signal Division, Eastern Industries, Inc.
Regent Street — East Norwalk, Connecticut
Attention: Mr. Paul L. Green
Sustaining Organization Representative

California Metal Enameling Company
6904 East Slauson Avenue — Los Angeles 22, California
Attention: Mr. Standish K. Penton
Sustaining Organization Representative

Crouse-Hinds Company
Wolf & Seventh North Street — Syracuse, New York
Attention: Mr. Kenneth W. Mackall
Sustaining Organization Representative

Fiberaised Bar and Line Company
P. O. Box 268 — Sausalito, California
Attention: Mr. John E. Perry
Sustaining Organization Representative

Flex-O-Lite Manufacturing Company
P. O. Box 3066 (Affton Br.) — St. Louis, Missouri
Attention: Mr. Preston D. Law
Sustaining Organization Representative

General Electric Company
920 Western Avenue — Lynn, Massachusetts
Attention: Mr. D. T. Carter
Sustaining Organization Representative

The Grote Manufacturing Company, Inc.
Bellevue — Kentucky
Attention: Mr. W. E. Miles
Sustaining Organization Representative

Hawkins-Hawkins Company, Inc.
1255 East Shore Highway — Berkeley 10, California
Attention: Mr. Norman L. Hawkins, Jr.
Sustaining Organization Representative

Hubbard and Company
6301 Butler Street — Pittsburgh 1, Pennsylvania
Attention: Mr. C. C. Warne, Jr.
Sustaining Organization Representative

Lyle Signs, Inc.
2720 University Avenue, S.E. — Minneapolis, Minnesota
Attention: Mr. R. H. Bjorklund
Sustaining Organization Representative

Magee-Hale Park-O-Meter Company
Commerce Exchange Building — Oklahoma City 2, Oklahoma
Attention: Mr. G. A. Hale
Sustaining Organization Representative

The Marbelite Company, Inc.
27 Warren Street — New York 7, New York
Attention: Mr. William E. Lenz
Sustaining Organization Representative

Minnesota Mining & Manufacturing Company
900 Fauquier Avenue — St. Paul 6, Minnesota
Attention: Mr. Donald O. Opstad
Sustaining Organization Representative

Miro-Flex Company, Inc.
1824 East Second Street — Wichita, Kansas
Attention: Mr. H. N. Carver
Sustaining Organization Representative

Portable Traffic Signals, Inc.
146 West 21st Street — Los Angeles 7, California
Attention: Mr. W. W. Taylor
Sustaining Organization Representative

Prismo Safety Corporation
Huntingdon — Pennsylvania
Attention: Mr. John C. Horn
Sustaining Organization Representative

Revere Corporation of America
Wallingford — Connecticut
Attention: Mr. Walter K. Davies
Sustaining Organization Representative

Reynolds Metals Company
2500 South 3rd Street — Louisville 1, Kentucky
Attention: Mr. Douglas McKellar
Sustaining Organization Representative

Robbins Tire and Rubber Company
Tuscumbia — Alabama
Attention: Mr. Ellis Webb
Sustaining Organization Representative

The Streeter-Amet Company
4101 North Ravenswood Avenue — Chicago 13, Illinois
Attention: Mr. George F. Graham
Sustaining Organization Representative

Traffic and Street Sign Company
84 Foundry Street — Newark 5, New Jersey
Attention: Mr. Walter M. Schoenfeldt
Sustaining Organization Representative

Tuthill Spring Company
760 Polk Street — Chicago 7, Illinois
Attention: Mr. H. T. Moore
Sustaining Organization Representative

Union Metal Manufacturing Company
1432 Maple Avenue, N.E. — Canton 5, Ohio
Attention: Mr. W. A. Porterfield
Sustaining Organization Representative

U. S. Porcelain Enamel Company
4635 East 52nd Drive — Los Angeles 22, California
Attention: Mr. J. L. Hodgkinson
Sustaining Organization Representative

Wald Industries, Inc.
301 Penn Street — Huntingdon, Pennsylvania
Attention: Mr. John R. Wald, Jr.
Sustaining Organization Representative

Strictly Business

Experimental School Sign

The Winko-Matic Signal Company of Lorain, Ohio, is now manufacturing a new school signal, known as Model BR25ATN. This new school signal combines the use of the standard Winko-Matic alternating flashing amber lights

with a Portland Orange grid system illuminating the speed limit message, on a blank-out principle. The new Winko-Matic is combined with a rectangular speed limit sign measuring 24″ x 36″, black and white, reading "School Speed Limit." The 35mph message shows in Portland Orange, and the flasher lights are Traffic Yellow. The whole unit is operated automatically by a time switch which provides three on and three off periods per day, eliminating operation on Saturday and Sunday. When the Signal is energized, both the flashers and the speed limit message are legible, the flashers illuminating alternately, while the speed limit message burns continuously. When the Signal is not energized, both the flashers and the speed limit message are illegible. This unit is specifically designed to present a slower speed limit, 15, 20, 25, etc., only during the times that are critical. The theory is that a slower or restricted speed limit used only during the necessary periods of the day will reduce the possibility of accidents through the critical zones. Several municipalities and states are contemplating the use of this new type school warning device, and the company is now in a position to make delivery through normal production. The speed limit can be easily changed to conform with speed zones as set up by local or state ordinances.

Traffic Signs Catalog Available

U. S. Porcelain Enamel Company of Los Angeles has just completed a complete catalog of traffic and street name signs, according to George MacQuoid and R. B. Evenson, of the Traffic Sign

Division. Every sign need for any city or county is illustrated and coded in the catalog as well as suggestions in regard to ordering special signs. The great majority of the signs shown in this descriptive catalog are carried in stock and may be obtained immediately, according to company officials.

A new feature of great interest to municipal officials is a section devoted to off street parking lot signs including signs for installation on the meter posts, attention compelling signs on the lot and directional signs.

Free Bead Dispenser Offered

An offer of a free bead dispenser is being made by the Flex-O-Lite Manufacturing Corp. of St. Louis, to those ordering a minimum of 2,000 pounds of glass beads.

The dispenser has been field tested for two years. It works equally well with standard type "A" beads, "Free Flow" beads or moisture resistant type "C" beads. It is a positive action, precision-built device for city or state highway use, built of rugged cast aluminum, 4″ wide.

The device is ordinarily sold for $39.95, and the current free offer is made for a limited time only.

3M's Introductory Codit Kit

A special offer in the form of a kit containing "Codit" brand reflective liquid (No. 7210), has been announced by Minnesota Mining and Manufacturing Co., St. Paul, Minn.

The introductory kit, described as an $85 value, is offered for $69.50. It contains enough of the fast-drying liquid to reflectorize 2,200 feet of alternate color curb marking; or 400 square feet of obstruction marking; or 100 12-foot-by-8-inch barricades, the company said.

"Codit" reflective liquid was recently developed by the 3M company for reflectorization of traffic hazards and other objects made of wood, concrete or other porous surfaces, such as median dividers, underpass abutments and walls, culverts, hydrants, safety islands, curbings, telephone poles, trees, guard rails and posts.

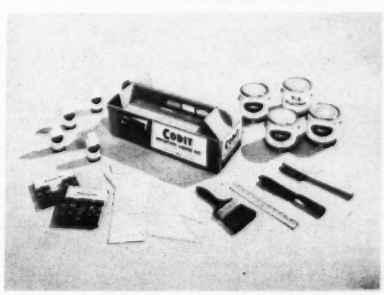
During the day it is light gray and blends with concrete or other light-colored objects. But at night under auto headlights it reflects back to the driver in bright silver—50 times brighter than white paint. A 6-by-8-inch application is identifiable as a hazard about 1,000 feet away under high beam headlights, the company said.

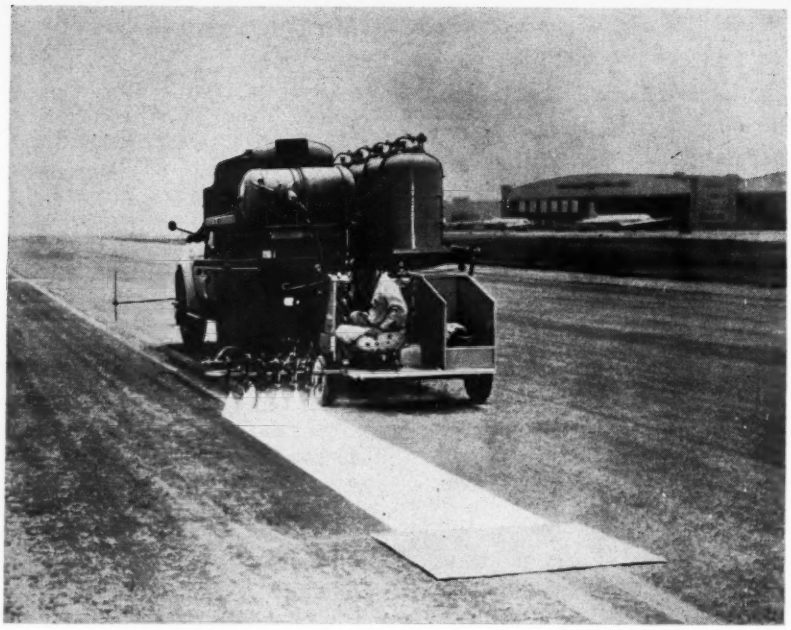
The portable introductory kit, which comes in a special carton that converts into a carrying case, includes: three 4-pound cans of reflective liquid; four 6-ounce spray cans of reflective liquid; 20 stencils for reflectorization of curbs and barricades; a wire brush for cleaning the surface to be reflectorized; two 60-yard rolls of masking tape; a 4-inch wide paint brush; a quart of brush cleaner; a measuring utensil; a stirring paddle; and a set of marking plans.

An application of the reflective liquid will last about one year, the company reports, depending upon the surface to which it is applied and weather extremes.

It is applied by brush or conventional spray equipment, and is described as "easy and economical" to apply. A 4-by-

(Continued on page 464)





Super Striper Does Big Job

Typical of the big striping jobs handled by the Port of New York Authority is the 10,000 foot all-weather runway at N. Y. International Airport, which requires 124,000 square feet of reflectorized striping. The custom-built Wald Model 7105 Truck-O-Liner sprays yard-wide stripes of paint and reflective material in a synchronized continuous operation. Conventional striping machines required weeks to do this job, now completed within a few days by the Wald "Super-Striper," especially designed to the Air Coordinating Committee's new marking standard. This equipment is also used for striping operations at La Guardia and Newark Airports, and is converted for the pavement marking of the Authority's other facilities, including the Lincoln and Holland Tunnels, the Outerbridge Crossing, George Washington Bridge, and the Bayonne and Goethals Bridges. Complete information about custom-built striping equipment for special requirements may be had from Wald Industries, Inc., Huntingdon, Pennsylvania.

3M's CODIT KIT

(Continued from page 463)

4-foot concrete abutment, for example, can be reflectorized in less than five minutes at about 15 cents per square foot, according to the company.

Further information can be obtained by writing Dept. 6-107R, Minnesota Mining and Manufacturing Co., 900 Fauquier Street, St. Paul 6, Minn.

Seven States Liberalize Vehicle Size and Weight Limits

Major changes in vehicle size and weight limits to make them more nearly correspond to those of surrounding states were enacted this year in Kentucky and Virginia, and other changes became law in five additional states, a survey by the National Highway Users Conference reveals.

Kentucky increased the maximum gross vehicle weight limit for designated highways from 42,000 to 59,640 lbs.; increased the permissible length for a tractor semi-trailer combination from 45 to 58 feet; and provided a 5 per cent tolerance for axle, tandem-axle and tire equipment weight limits.

Virginia measures, effective June 29, 1956, increase combination length limits from 45 to 50 feet; exempt trailers and semi-trailers from single-unit length limits; replace single-unit weight limits with a table of weights based on axle spacing ranging from 32,000 lbs. for 4 feet to 56,800 lbs. for 35 feet; and provide for use of 40-foot buses in cities and towns, and 102-inch wide buses in Arlington County. A new law currently in effect increased the length limit for mobile home combinations to 55 feet.

Georgia repealed its bridge formula weight limits; provided a 13 per cent increase or tolerance for single unit length limits and for wheel and axle weight limits; increased the permissible vehicle combination length from 45 to 48 feet; and provided a maximum gross vehicle weight limit of 63,280 lbs., together with a gross weight limit for secondary roads of 56,000 lbs.

New York repealed more restrictive single unit weight limits, to permit weights of 44,800 lbs. for 4-wheeled vehicles, and gross weights computed by its bridge formula for vehicles with more than 4 wheels.

Mississippi provided an exception to the 45-foot vehicle combination limit to permit automobile transports a length of 50 feet. Pennsylvania increased the length limit for a tractor semi-trailer combination from 45 to 50 feet, and granted automobile transporter semi-trailers a 30-inch tolerance over the 35-foot single unit limit. South Carolina provided that auto transports of up to 40,000 lbs. gross weight and vehicles hauling Defense Department materials may have a height of 13½ feet on highways where clearance is sufficient; increased length limits for mobile homes, and limited combinations over 50 feet long to daylight operations.

Puzzle Corner

Match Stick Puzzle

Hans Schwar of Pretonia, S.A. submitted the following puzzle:

Take 8 matches (or sticks of equal length) and with these make one square and four triangles without using the inside of the square for making triangles.

Long Division Problem

For those mathematical inclinations the following problem is submitted for their amusement:

```
                x x 8 x x
          ---------------
x x x ) x x x x x x x x x
        x x x
        -------
          x x x x
            x x x
        -------
              x x x x
              x x x x
        -------
```

The problem is to determine the divisor and the dividend.

Anne Leftwich Goes to New Position in New Haven

Miss Anne Leftwich, for nearly eight years identified with the Institute of Traffic Engineers in its New Haven office, has accepted a new position with the Scientific Research Society of America. This organization is a national professional group, somewhat similar in its general operations to the ITE. Miss Leftwich will become Administrative Assistant, with duties comparable to those she carried out with the Institute. The office is in New Haven, near the University campus.

Section News

MICHIGAN SECTION

President **Gervais** called the meeting to order.

The minutes of the previous meeting were read by the secretary and approved as read.

Old business brought forth from **Al Malo** that the Statler Hotel would be headquarters hotel for the 1957 ITE Convention in Detroit. He is arranging a meeting of the convention committee so that a progress report can be made in Denver.

Gordon Sheehe reported on an Education Engineering Conference held at MSU April 19th. The shortage of man power due to accelerated construction was discussed. The possibility of training engineering aides and technicians in two years was also discussed. It was decided that a program should be set up to train high school grads who don't go to college. Greater use of tape recordings for disseminating information was urged. The biggest question in traffic engineering is "Where do we go from here?"

In discussing new business **Carl McMonagle** decried the lack of publicity in the local press in regard to section meetings. The public through the press should know what is going on. President **Gervais** remarked that other sections issue extensive bulletins. It was decided to invite the press to the next meeting—the annual meeting.

Walt Splain, representing the Michigan Petroleum Association, told how the word is being spread around about the cordial relationship between the petroleum industry and the Michigan State Highway Department as compared to some states.

Gordon Sheehe pointed out that one function of the new Safety and Traffic Center at MSU was to send out bulletins, etc., to groups, giving a summary of what is being done and acting as a clearing house for new ideas.

President **Gervais** appointed a committee on curb cuts to work with the MPA. **Russ Harrison** was appointed chairman with **Harold Bauerle, Seymour E. Bergsman, Jerome Franklin** and **Sam Levine** as members.

President **Gervais** announced that the next meeting would be the annual meeting and that arrangements were being made for this meeting. Due to conflicts it would be necessary to hold the meeting early in June instead of the latter part of May.

Business meeting ended 8:25 P.M.

Program Chairman **Frank Ronan** introduced **Walt Pletcher**, Assistant to the Director, Traffic Safety Association of Detroit, who gave a comprehensive report on pedestrian accidents in Detroit. Some pertinent facts from his report show that children are a problem with a high death rate for low age group. Spring and summer are the most dangerous seasons for children. In analyzing accidents involving adults in the age group 50 to 55 Friday and Saturday were the two high accident days and fall and winter were the worst seasons. Fatalities to injuries in the age group 0 to 5 years was 1 fatality to 78 injuries while in the older age groups the rate was 1 fatality to 5 injuries. Adequate lighting at intersections was stressed as a factor in safety to pedestrians.

Walt pointed out that the Association carries on an extensive campaign with pamphlets to the first, second and third graders, a special campaign in May—the high month—posters, billboards and special emphasis by the oil industry with posters "Watch Out for Kids."

He stressed the need for a higher fine for pedestrian violators and mandatory appearance in court.

Our thanks to **Walt** for an interesting and informative discourse on a difficult problem which many cities think is too "hot" to handle.

Associate Editor
Allen T. Hayes

MIDWEST SECTION

Taken from Midwest ITEMS, **Elizabeth A. Jackson**, Editor.

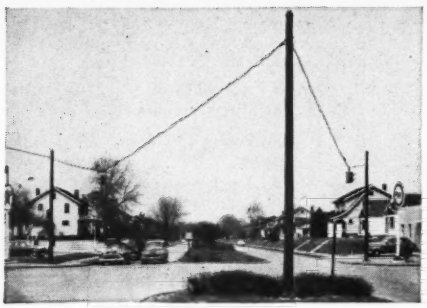
April Meeting

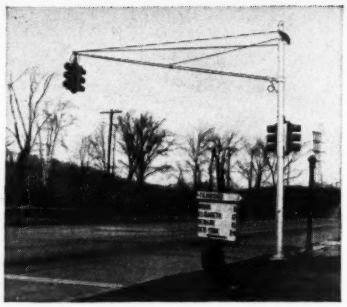
On April 19, thirty-six sports minded ITEs gathered at the Chicago Engineers Club to replay the 1955 World Series. The feature of the evening was the showing of the official film of the Series arranged by **Larry Dondanville** and the National League Office.

The film afforded a good view of all the stellar plays and disputed decisions and, although it looked as if Billy Martin should have been safe and Jackie Robinson should have been out, the fact remains that Sandy Amoros is still making that fantastic catch (twice, in fact) and the Dodgers emerge victorious every time the film is run.

Preceding the meeting approximately thirty members made the first technical field trip viewing the mechanism and

RESPECTED!
OBEYED!
SAFE-T-CONE*
All-Rubber TRAFFIC GUIDES
The silent workhorse of efficient traffic control!
*U.S. Pat. Number 2,719,505
NOW IN 3 SIZES!
28 IN.
18 IN.
12 IN.
SPECIAL ADAPTERS INCREASE USES!
Signs-Flashers-Flag Adapters
PAINTED OR REFLECTORIZED
12" size all yellow on black base only. 18" and 28" available in standard tri-color or REFLECTORIZED all-yellow on black base.
NEW! Flasher lights!
Uses standard 6-volt battery. Fits into top of all sizes. Unbreakable plastic lens.
2121
Low cost, long life, light weight make SAFE-T-CONES ideal for every traffic control need. Tough and strong, they're made to last, even with most abusive use.
Write for complete descriptive folder
SAFE-T-CONES are made only by RADIATOR SPECIALTY CO., Charlotte, N. C.





UNION METAL TRAFFIC SIGNAL POLES

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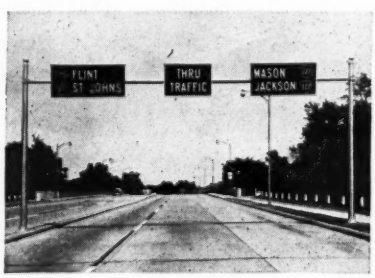

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operation of the radio coordinated traffic signal system. The tour started at LaSalle and Kinzie Streets where the radio receiving and signal controlling equipment was observed in operation. The group then hiked to the Board of Trade building radio transmitter with a stop at City Hall basement to view the master control.

This tour, the first of a series planned to precede the monthly meetings, was very ably conducted by **Ralph Michel** and **Dick Walons.**

Traffic Engineering at U. of Illinois

"What is being done at the University of Illinois in the field of Traffic Engineering?", is a question raised by members of the Midwest Section. ITEm's therefore directed the same question to Mid-ITE **John E. Baerwald** who is in charge of the program. He stated that a comprehensive educational and research program has been initiated and will be expanded and developed as the needs, staff, and funds materialize.

Four traffic engineering subjects are now being offered each school year. These courses are Highway Traffic Characteristics, Traffic Planning Studies, Traffic Operations, and Geometric Highway Design. Each course is for four credits and includes classroom, laboratory, and field instruction.

The Highway Traffic Characteristics course covers driver, vehicle, and roadway characteristics, and a brief introduction to the many phases of the traffic engineering profession. This course is open to senior and graduate students. Usual enrollment includes students majoring in engineering, city planning, and driver education.

The Traffic Planning Studies course covers the design and application of the various types of traffic planning studies, their interrelationship, and their use in programming traffic engineering improvements.

Various methods for making the best and most efficient use of existing highway facilities are studied in the Traffic Operations course.

The geometric design features of roadways, intersections, and interchanges in rural and urban areas are reviewed in the Geometric Highway Design course.

Graduate students in the traffic engineering curriculum also study such courses as Highway Administration and Finance, Municipal Engineering, and Highway Pavement Design which are offered in the Department of Civil Engineering.

The students are also encouraged to take certain non-engineering courses such as city planning, transportation economics, and statistics.

As the enrollment of graduate students increases, additional courses will be developed. Included among these may be courses relating to general transportation, highway transportation, mass transportation, traffic engineering administration, accident analysis, and traffic signals and other control devices.

It is anticipated that other departments on the campus will ultimately offer service courses for traffic engineers, especially in the fields of electrical engineering, statistics, law and psychology.

Active members of traffic engineering can provide valuable assistance to the University by bringing the curriculum to the attention of worthy students; by commenting on the curriculum in order to enable the continual development of new members of the profession who have educational background; and to assist the University by appearing as guest lecturers, by arranging field trips, and by keeping the members of the staff informed of changing developments in the profession.

Siegel to Leave Chicago

Ted Siegel, who has been associated with the National Safety Council's Traffic Operations Division for three and one-half years, will become City Traffic Engineer of Indianapolis, Indiana on May 28, 1956. **Ted** was on the staff of the Bureau of Street Traffic for more than two years before he began working for the National Safety Council.

Among **Ted's** many claims to fame is ITEms. He originated and was the first editor of the Midwest Section's newspaper. He has agreed to be the Indiana correspondent after May 28.

The staff of ITEms and the entire Midwest Section wish **Ted** congratulations and luck!

MISSOURI VALLEY SECTION

The annual meeting of the Missouri Valley Section was held in Columbia, Missouri on May 17. Present were, President **J. J. Feuchter,** Secretary-Treasurer, **A. J. Basile,** Members, **W. J. Armstrong, L. W. Corder, H. M. DeNoble, O. J. Falin, E. C. Henry, Jr., J. A. Hutter** and **G. C. Lichty.** Section Affiliate Members present were **G. F. Barclay** and **P. F. Fisher.** Distinguished visitors were Messrs. **Harmer E. Davis,** Director, Institute of Transportation and Traffic Engineering, University of California, **H. E. Irby,** Professor of Civil Engineering, University of Missouri, **A. A. Acton,** St. Louis City Traffic Department, **S. F. Mulkey,** St. Louis City Traffic Department, **Floyd I. Jones,** Traffic and Safety Department, Kansas State Highway Commission, and **B. H. Krietemeyer,** Traffic and Safety Department, Kansas State Highway Commission.

Messers. **Floyd I. Jones, B. H. Krietemeyer** and **Victor N. Napolilli,** (of the St. Louis City Traffic Department), were voted in as Section Affiliate Members, bringing the total membership to 40 members and 11 Section Affiliate members. The Missouri Valley Section continues to be the fastest growing ITE section in the world.

New officers for the forthcoming year were elected and they are as follows:

Robert L. Meyer, Traffic Engineer, Nebraska Department of Roads and Irrigation, President.

Jack A. Hutter, Director, Traffic Department of Kansas City, Vice-President.

A. J. Basile, Traffic Control Engineer, Kansas State Highway Commission, Secretary-Treasurer.

As a matter of new business, the Section elected to adopt for future use as a name symbol, the title "MOVITE." All members of the Missouri Valley Section will henceforth be known as "Movites," which is to say they will be

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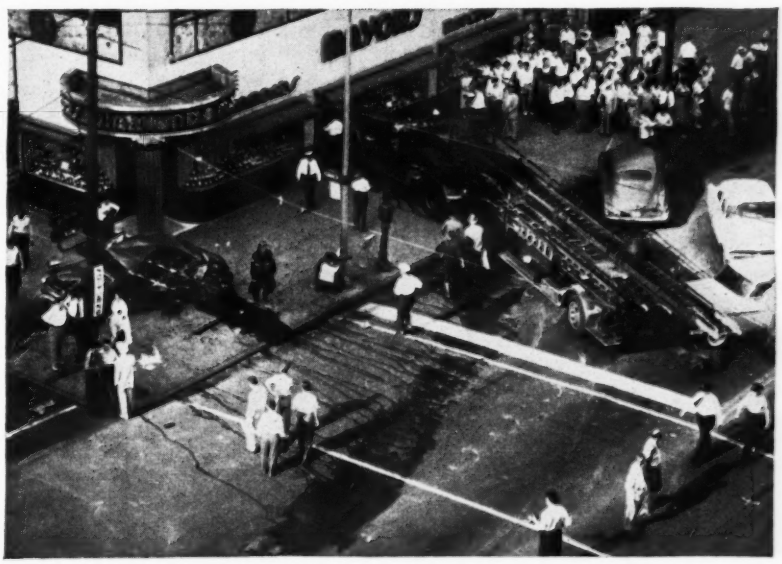

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INDEX TO ADVERTISERS

A'G'A Division of Elastic Stop Nut Corporation 422
G. M. Basford Company, New York

Aluminum Company of America 432
Fuller & Smith & Ross, Inc., Cleveland, Ohio

Automatic Signal Division of Eastern Industries, Inc. 442
Remsen Advertising Agency, Inc., New Haven, Connecticut

Cataphote Corporation 438
Richard T. Brandt Advertising, Cleveland, Ohio

Crouse-Hinds Company 450
Barlow Advertising Agency, Inc., Syracuse, New York

Dual Parking Meter Corporation 424
Griswold-Eshleman Co., Cleveland, Ohio

Duncan Parking Meter Corporation 446

Eastern Metal of Elmira, Inc. 451
Laux Advertising, Inc., Ithaca, New York

Electronic Protection, Inc. 467
Merrill, McEnroe & Associates, Inc., Chicago, Illinois

Flex-O-Lite Manufacturing Corporation 452
Ralph Smith Advertising Agency, St. Louis, Missouri

Grote Manufacturing Company, Inc. 448
Peck-Heekin Advertising, Cincinnati, Ohio

Harbor Plywood Corporation ..... 444 & 445
Milton Weinberg Advertising Company, Los Angeles, California

Kaiser Aluminum and Chemical Corp. 421
Young and Rubicam, Inc., San Francisco, California

Lyle Signs, Inc. 468
Alfred Colle Company, Minneapolis, Minnesota

Minnesota Mining and Manufacturing Company 435
Ruthrauff & Ryan, Inc., St. Paul, Minnesota

Magee-Hale Park-O-Meter Company 426
The McCormick-Armstrong Company, Wichita, Kansas

Prismo Safety Corporation ..... Back Cover
Michener & O'Connor, Inc., Harrisburg, Pennsylvania

Radiator Specialty Company 465
Bennett — Advertising, Inc., Charlotte, North Carolina

Streeter-Amet Company 443
Brandt Advertising Company, Chicago, Illinois

Union Metal Manufacturing Company 466
Griswold-Eshleman Company, Cleveland, Ohio

Veon Chemical Company ..... Inside Front Cover
Duncan Brooks, Inc., Mineola, New York

Wald Industries, Inc. 440
Michener & O'Connor, Inc., Harrisburg, Pennsylvania

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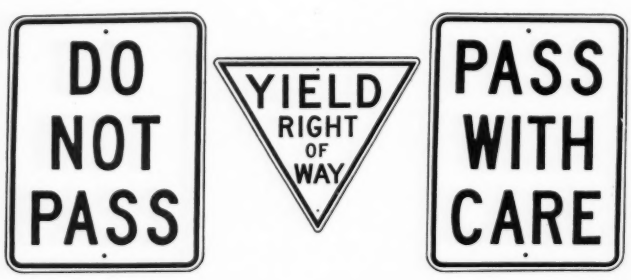

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moving forward faster than progress itself.

One of the high points of the annual meeting was the address presented by **Harmer Davis,** during the late hours of the meeting. The entire Section was delighted to hear, see, and fraternize with Harmer, who henceforth, in this midwestern area will not be known as Doctor, Professor or Mr., but as either Harmer or "Wyatt Earp."

All Section members and visitors mentioned above attended the Eighth Annual Traffic Engineering Conference at the University of Missouri. Panel discussions on toll roads versus freeways, off-street parking and the desirability of state speed limits were presented. Our distinguished visitor, **Harmer Davis,** presented a very fine discourse on the economic effect of access control, and also presided over the panel which discussed the toll road and freeway question.

Leon W. Corder
Associate Editor

TEXAS SECTION

Clipped from TEX-ITE Newsletter, **Winston H. Carsten,** Secretary-Treasurer.

Traffic Engineering Short Course

A short school on Traffic Engineering which was co-sponsored by the Texas Section of the ITE, was held at Texas A&M the week of February 20. The school was designed for representatives from the smaller cities which do not have traffic engineers. Numerous members of the Texas Section volunteered their services as instructors and as a result of their fine co-operation an excellent program of instruction was offered.

D. Grant Mickle of the Automotive Safety Foundation keynoted the program with an opening address. The remainder of the instruction was apportioned among Messers. **Brandes, Carsten, Greer, Maier** and their associates.

Jack Keese is to be congratulated for his part in this extremely worthwhile cause and it is hoped that this program will be made an annual affair.

Texite Conference at Ft. Worth

Bob Buckman is working hard on the arrangements for the forthcoming conference to be held June 9 and 10. It appears if his arrangements are successful TexITE members will have an opportunity to get some first hand information on new ideas for traffic control in the downtown areas.

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